CHEMICAL MARKETS

VOLUME XXIV ESTABLISHED 1914 NUMBER 6

Contents for June, 1929

CHEMICAL MARKETS, INC., Publishers

Publication Office, 28 Renne Ave., Pittsfield, Mass. Editorial and General Office, 25 Spruce St. New York City

WILLIAMS HAYNES, PRESIDENT; D. O. HAYNES, JR., VICE-PRESIDENT; WILLIAM F. GEORGE, SECRETARY-TREASURER

PUBLISHED ON THE TENTH DAY OF EACH MONTH AT PITTSFIELD, MASS. SUBSCRIPTION TWO DOLLARS A YEAR, IN ADVANCE, POSTPAID TO ALL COUNTRIES; SINGLE COPIES, CURRENT ISSUE, 25 CENTS; BACK COPIES, 50 CENTS EACH. NOTICE OF THREE WEEKS IS NECESSARY TO CHANGE SUBSCRIBER'S ADDRESS AND IN WRITING PLEASE GIVE BOTH THE OLD AND NEW ADDRESSES. PRINTED FOR THE PUBLISHERS BY THE SUN PRINTING COMPANY, PITTSFIELD, MASS. ENTERED AS SECOND CLASS MATTER, JANUARY 1, 1928 AT THE POST OFFICE AT PITTSFIELD, MASS., UNDER THE ACT OF MARCH 3, 1879.

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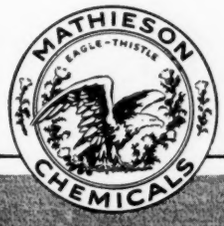

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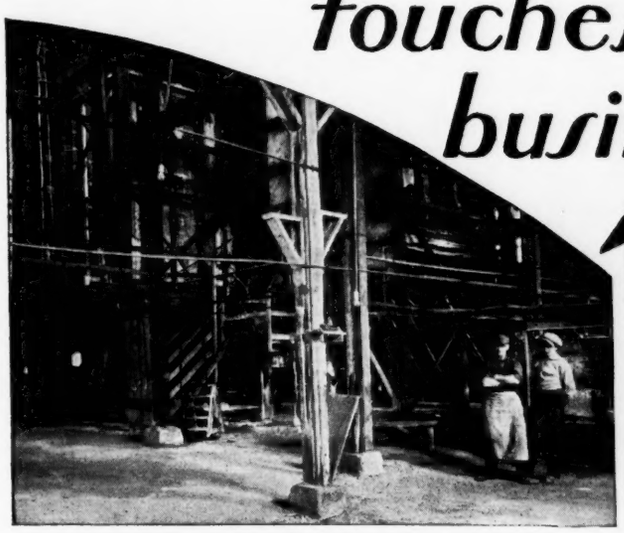

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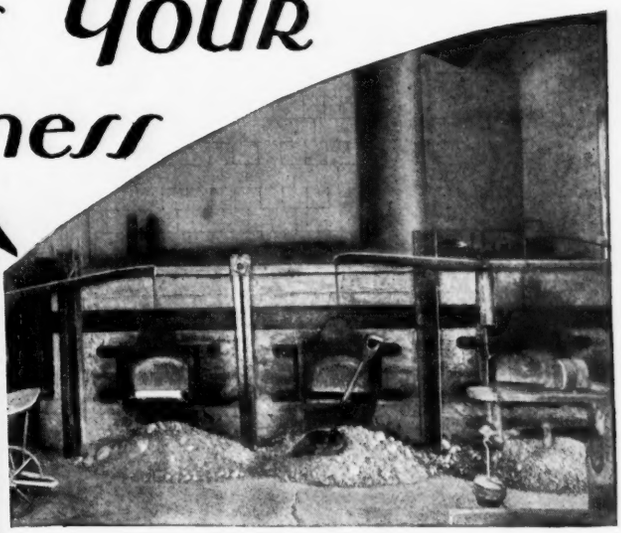

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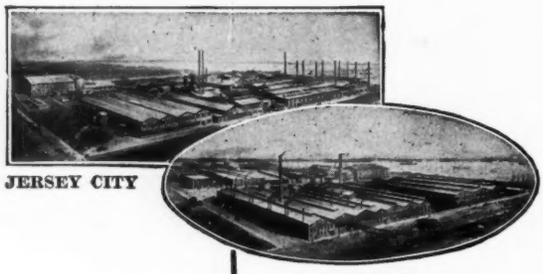

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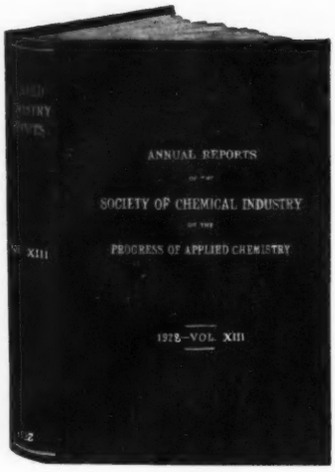

THE Volume illustrated here, is published annually by THE SOCIETY OF CHEMICAL INDUSTRY In England. It consists of Reports on the Progress made in the various departments of Applied Chemistry during the preceding year. Each Section is contributed by an acknowledged Expert in the Subject on which he writes. The whole Work constitutes the most comprehensive record of the advances made in the various branches of Chemical Technology and should find a place in YOUR reference library.

CONTENTS OF VOL. XIII (1928)

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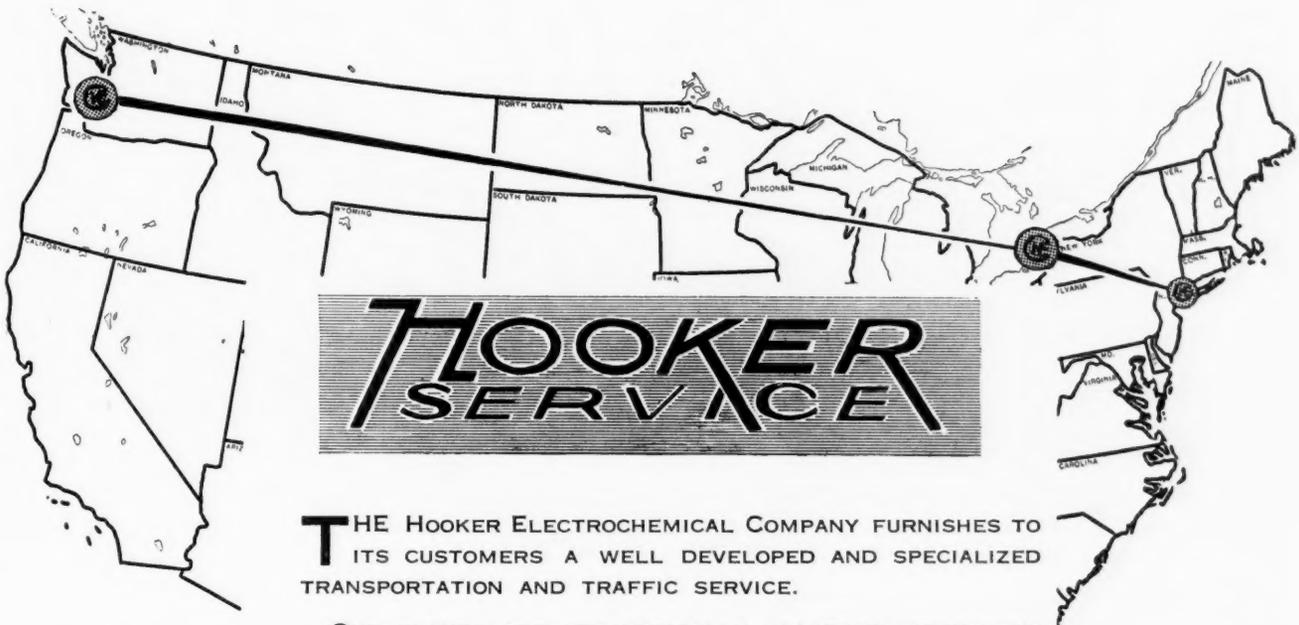

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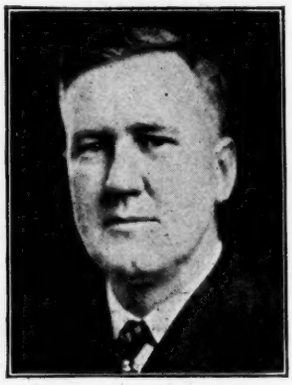

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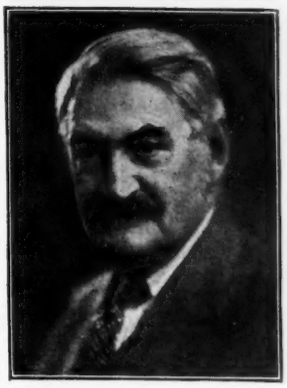

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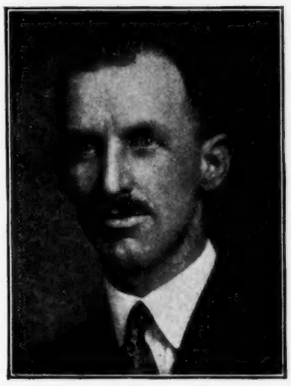

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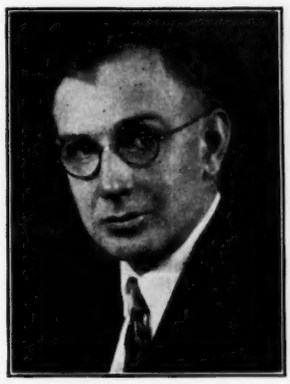

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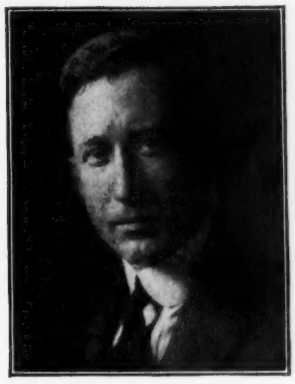

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CHEMICAL MARKETS

VOL. XXIV. JUNE, 1929 NO. 6.

The Skeleton in the Laboratory

FOR many years science and industry lived not upon good terms in America. They had no active quarrel. They tolerated each other, as it were: but they did not co-operate. Neither understood the other: neither made any effort to effect a better mutual understanding. The War revealed this skeleton in our chemical closets.

ACCORDINGLY, constant propaganda has been directed against the chemical executive to sell him the idea that chemical industry, being based upon chemical reactions, should be subject at every step to chemical control, and that its future development lay in the wake of progress made in the pure science of chemistry. The poor tired business man has been severely lectured upon these subjects and unmercifully ragged for his dumbness in learning these lessons. He has been bombarded with statistics and pelted with allegories. Threats of bankruptcy have been held over his head and before his nose have been dangled promises of profits. Varying degress of adroitness, fiction, fact, and fable have been employed in this good cause of selling chemistry to the executive.

HE HAS been sold. By and large, our chemical industrialists are convinced that in a general way chemical control cuts plant costs and that in the long run research work pays dividends. A chemist is no longer considered a pleasant sort of luxury, like a bed of geraniums in the factory yard; but a sort of necessary evil, like advertising or the trade association. This general attitude may not bespeak a complete understanding. At least it signifies a keen interest from which sympathetic comprehension of chemical problems will follow.

IN OTHER words, the skeleton has been driven out of the director's room and the private offices. It lurks still in college halls and laboratories. Chemists, and the teachers of chemists know little of the practical economic problems of the industry which puts their science to work for the benefit of mankind, which offers the one employment and which raises endowments for the other. And so we rise to propose an educational campaign to sell the science of chemistry the idea of the chemical industry. Technical papers please copy.

"See American First"

ROBERT FULTON *found the waters of the world a bar to human progress; he left them the highways of commerce. The feasibility of steam navigation was first demonstrated August 11, 1807, when the "Clermont", popularly termed "Fulton's Folly", proceeded up the Hudson River from New York City to Albany. The journey consumed about 36 hours. Thus was opened an era of transportation which tremendously contributed to the development of America.*

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Mr. Hawley's Chemical Schedule

The Hawley draft of the Hawley-Smoot Tariff Bill, as presented in House last month, did not greatly surprise any one interested in the chemical schedules who has followed the tariff hearings. The changes were moderate, and although the number of additions have been sufficient to draw fire from some Democratic journalists, nevertheless they are almost without exception duties on new chemical products which have won a place in our markets during the past three or four years. The big joker—and one always creeps into every tariff bill—is the tax on molasses which will figure out in alcohol made from this raw material at about six cents a gallon. This would be a tolerable burden to put on the shoulders of the automobilist and the industrial consumer, especially since the tax is admittedly insufficient to bar molasses in favor of corn as the farmers proposed. With this exception, and remembering the complexity of inter-relationships in chemical products, Mr. Hawley's committee seems to have lived up to the President's promises of as little tariff tampering as possible.

The Coming of the I. G.

If the American chemical industry is stupid, or lazy, or inefficient in plant, laboratory, or sales office; then the coming of the I-G spells disaster to those units which will be in direct competition with their American operations. Under such circumstances, this potent and aggressive organization might so spread itself that it would be able to dominate every important branch of chemical enterprise in the United States. We believe that this doleful eventuality—or anything approaching it—is quite remote.

The eagerness of the American public to over-subscribe the offering of the American I-G Company stock and the representation of the Ford, Standard Oil, and National City Bank interests on their directorate indicated that the immigrant industry will not lack for funds or friends. They are a powerful, experienced, well organized competitor; dangerous and deserving to be watched: but they are not omnipotent, and they have their own weaknesses and handicaps. They are not so astute, nor are their American compeers so foolish, that we shall be submitted to that dangerous form of competition arising from superior management. Nor have they, despite their older and wider experience, a monopoly on chemical brains and technical skill. American salesmanship gives us a distinct advantage in American markets. It is fortunate indeed that our leading chemical executives hold these views; for if our chemical leaders were paralyzed with fear, then the most direful prophecies of impending disaster would be most apt to come true.

The two most serious aspects of the coming of the I-G are the establishment behind our tariff wall of a leading exponent of the new European subsidized, cartelized industrialism and the possibility that American leadership in research and technical development may pass to foreign interests.

At the chemical industries dinner in New York last month, Colonel Donovan pointed out plainly that any foreign company coming to this country puts itself under the jurisdiction of our anti-trust laws. Their tangible assets in our midst become at once a promise of their good intentions and a pledge for their good behavior. Washington will have the right to scrutinize every I-G plan and proceeding.

New products or improved processes in a plant abroad may be kept out of competition with a sluggish American chemical development by a prohibitory tariff, which thus acts a check upon the incentives to research. Moreover, the possibility of leasing American rights of foreign improvements tends also in the same backward direction. But a new product offered directly in our domestic markets or a new process that cuts costs in a competing plant within our borders cannot but spur us to direct action and thus stimulate, rather than dull, research activities.

It is never pleasant to face new, strong competition. It is far less than pleasant when this is foreign competition financed by good American dollars. The coming of the I-G is, however, a logical step on their part and by no just, legal means might they have been barred out. It would be foolish to minimize the seriousness of the competitive situation which may arise; but it is certainly no wiser for us either to boast that we shall beat these invaders at their own game or to bewail in advance our sure and certain defeat.

What's in a Name?

Once again the Chemical Exposition has come and gone, and again the same comment is heard on all sides. That it was an excellent exposition of chemical machinery is admitted by all, but where were the manufacturers of chemicals ?

Sixty thousand persons attended the show and the end of the week found the equipment

exhibitors tired but rejoicing, with well-filled order pads and live leads sufficient to occupy them for some time to come. It is but natural to assume that chemical manufacturers are missing something in their failure to assume a rightful position of prominence in an event of such importance. The few who took part, although almost lost under the shadow of huge autoclaves, driers and other equipment, report that they have nothing to regret. But even these staunch few must have wondered at times if they were not out of place.

When manufacturers of chemicals, through mere lack of numbers, seem out of place at a Chemical Exposition, the industry as a whole leaves itself open to considerable censure. Pride alone should prompt an industry of the size of ours to support this event of nationwide and even worldwide importance, which, after all, takes place only once in two years. It is notable that the true chemical exhibitors this year are enthusiastic for solid business reasons, and thus, many happily forecast a return of chemicals to the Chemical Exposition.

Quotation Marks

A few days ago a Grecian horse came to town labeled "The American I. G." In it were the same old crowd, Karl Bosch, Ludwigshafen, Leverkusen—the German I. G. . . . This horse has been brought here for the purpose of cutting the throat of our chemical independence, our safety in national defense, and the protection and health of our children . . . to destroy the progress we have made. It has been brought in here by a group of our commission-mad bankers who have taken $30,000,000 out of the funds in their custody, or under their control, to assist the I. G., under the guise of bonds, in the new war to destroy our chemical progress. Always and forever remember the stake for which the Germans strove before the war and in the war and since the war—world power through a monopoly of science.—*Francis P. Garvan.*

The chemical industries are among the foremost of those that ally themselves continuously with workers in pure science and thereby quickly transform discoveries of creative research into practical products for human use.—*President Herbert C. Hoover.*

It will be more important one of these days, to, educate men and women to use their leisure time than it will be to educate them for an occupation.—*Nicholas Murray Butler.*

Nothing dies so hard and rallies so often as the spirit of intolerance.—*Senator William E. Borah.*

The new organization (the American I. G.) is very far from being unimportant, but in some quarters its importance seems to be greatly exaggerated. So far as mere distribution of product is concerned, it may not be very dissimilar from, nor indeed vastly greater than, I. G. Dyestuffs, formed in this country (England) some time back for the distribution of German chemical products. Instead of indicating a combative mood on the part of the I. G., it is a move that German chemical interests might naturally have been expected to make in view of the enormous growth of Imperial Chemical Industries, and the contacts, direct and indirect, established between I. C. I. and American and Canadian interests.—*Chemical Age, London.*

The textile industry as a whole has been as acutely depressed during the last few years as any other industry or agriculture. The textile industry sought comparatively few advances and changes in its tariff schedules, because, while it cannot exist without adequate tariff protection, it realizes that most of the competitive difficulties with which it is suffering are largely of domestic origin. It asked for few additional tariff favors and it seems likely to obtain fewer than it asked for. In comparison agriculture is a major tariff beneficiary.—*Textile World.*

It is not the crook we fear in modern business, but the honest man who doesn't know what he is doing.—*Owen D. Young.*

Ten Years Ago

From our issues of June 1919

Tennessee Copper & Chemical Corp. was incorporated in New York with capital of from 400,000 to 800,000 shares of no par common stock. Active capital was announced as $1,000,000.

British Dyestuffs Corp. was formed in England with capital of $30,000,000 by merger of British Dyes, Ltd., and Levenstein, Ltd.

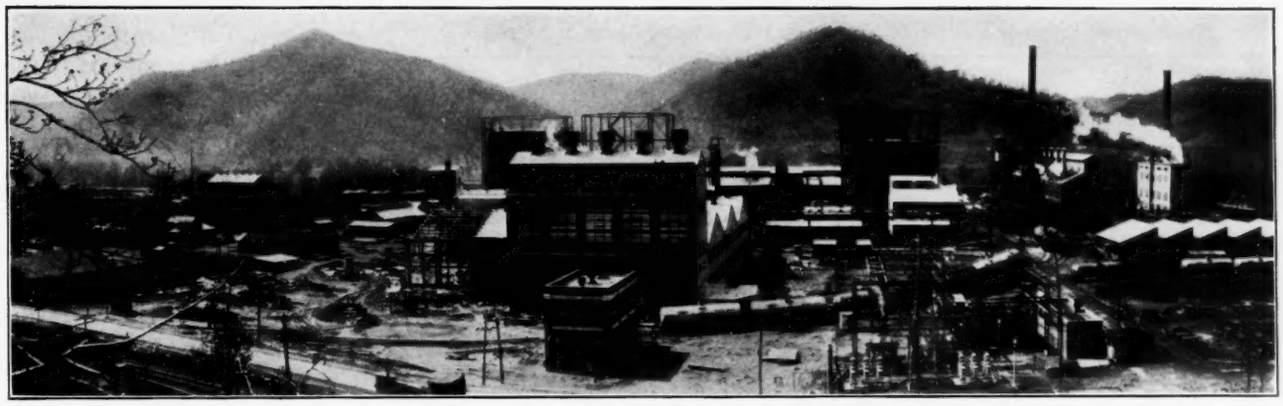
W. F. George Chemicals, Inc., was incorporated in New York with capital of $10,000. W. F. George, F. C. Nickerson and C. B. Hughes were named as incorporaters.

William T. Miller Aniline & Chemical Co. was formed in Brooklyn with capital of $50,000 by A. E. F. Zillessen, G. F. and W. T. Miller. The latter resigned as secretary, National Aniline & Chemical Co., to enter business on his own account.

W. D. Huntington, vice-President, Davison Chemical Co., was appointed consulting advisor on the projected acid developments of Tennessee Copper & Chemical Corp.

United States Alkali Export Association elected following officers: president, Eli Winkler; vice-president, H. G. Carrell; secretary and treasurer, H. M. Hooker; manager, E. V. Finch.

William J. Matheson resigned as chairman of the board and president of the National Aniline & Chemical Co., Orlando F. Weber was elected to succeed him in both positions.



Retrospect and Prospect *in the* NITROGEN INDUSTRY

By Chaplin Tyler
*Lazote, Inc.**

IT is particularly fitting at this time to review briefly the recent history of the nitrogen industry and to speculate as to possible future developments, since it is apparent that a world-wide program of relatively rapid expansion of nitrogen production is now taking place.

Among the various questions discussed by producers and consumers alike is one that almost defies rational analysis—whether the world can consume the greatly increased outputs of nitrogen that presumably will soon become available. The recent composite opinion of the best authorities is that a marked over-capacity is imminent in both the natural and synthetic branches of the industry; yet in the face of such opinion the plans for new projects seem to be more ambitious than ever. Fortunately, the immediate outlook in this country appears to be sound—the only cloud on the horizon being the possibility of subsidized production of nitrogen at Muscle Shoals, which if authorized, could under no circumstances be expected to help either producer or consumer. If the nitrogen industry is left free to work out its own salvation, the future will no doubt parallel that of any of the newer basic industries, the progress of which has always been in the following stages:

"Nitrogen ... is relatively one of the cheapest essential articles of commerce ... To adopt a policy of waiting for still cheaper nitrogen, is to forego substantial returns immediately obtainable."

(a) A stage of fundamental research and technical development during which one or more major processes will be evolved.

(b) A stage of commercialization, characterized by over-expansion and by the ultimate elimination of the weaker, poorly-managed companies.

(c) A stage of consolidation and stabilization characterized by concentration of production in relatively few strong hands, resulting in maximum consumption at lowest possible prices.

Obviously the nitrogen industry as a whole has not yet entered the third of these stages, although progress in Germany has to date been nothing short of remarkable, as is shown by the world production statistics for the years 1913, 1918 and 1928 as expressed in Tables I, II and III, respectively. The exact figures are not available for the year 1918, due to the incompleteness of statistics during the war, but it is believed that a fair estimate has been made. The figures for 1928 are based on latest available information. Table IV is derived from the previous tables.

It will be noted that in 1913 the production of nitrogen from coke ovens had attained great im-

**The picture heading the page shows the Belle, West Virginia plant of Lazote, Inc.*

TABLE I

World Production of Inorganic Nitrogen, 1913 (Metric Tons of Nitrogen)

	By-product Processes	*Cyanamide Process*	*Arc Process*	*Synthetic Ammonia*	*Total*
Germany	112,700	8,000	...	7,000	127,700
U. S. A.	36,300	...	...	...	36,300
England	90,100	...	...	...	90,100
France	15,500	2,000	...	...	17,500
Italy	2,800	2,700	...	...	5,500
Norway	...	4,000	15,000	...	19,000
Canada	2,000	8,600	...	...	10,600
Japan	1,500	1,300	...	...	2,800
Chile	...	...	...	...	430,000
All other	20,000	6,000	...	...	26,000
Total	280,900	32,600	15,000	7,000	765,500

portance and that the three synthetic nitrogen fixation processes together contributed only 54,600 tons of nitrogen, or 7.2 per cent. of the world production. Since the world production of inorganic nitrogen in 1900 was about 300,000 metric tons, the average increase in production during the period 1900–1913 was 36,000 metric tons per year. During the period 1913–1928 the estimated average increase in world production was nearly twice as great, or 70,000 metric tons per year. Apparently the rate of increase in the next few years will be approximately 100,000 metric tons of nitrogen per year.

Examination of Table II indicates that in 1918 by-product nitrogen production was highly developed and the cyanamide industry had as a result of the war been very rapidly expanded. In fact, the rated capacity of cyanamide plants at the end of 1918 is said to have been at least twice the actual production. The ammonia synthesis was developed commercially in Germany, whereas the rest of the world depended largely upon Chile nitrate and by-product nitrogen. As is well known, the Government laboratories in the United States and in England studied intensively the ammonia synthesis, but the commercial stage was not reached during the war.

Tabel III shows the present commanding position of the United States with respect to by-product nitrogen recovery. The cyanamide industry had a good year during 1928, with some expansion still taking place. However, the output of nitrogen by the ammonia synthesis outstripped all other sources by a big margin, and now the process is established on a sound commercial basis in England and in the United States, as well as in Germany. The figures for 1928 do not indicate truly the recent commercial progress made in the United States and in England, and it is expected that by the end of 1930 the rate of production in each of these countries will be at least 140,000 metric tons of nitrogen per year.

Consideration of the probable future nitrogen consumption involves so many factors that discussion will be confined largely to the situation in the United States. Doubtless the future of the nitrogen industry in Germany and in England depends very materially upon the success with which export markets are developed. Other countries, including our own, appear to be striving to attain national independence in the matter of nitrogen supply, so that export markets do not for the present, at least, constitute a problem of critical importance. Assuming this to be true, the new domestic nitrogen supply must either find new outlets or must displace the equivalent of imports. The actual results probably will be determined largely by price.

Relative to the increased use of nitrogen in American agriculture, it is believed that most of the increase will result from more intensive cultivation of smaller land areas. Already land values in most agricultural sections have increased to such an extent that taxes on unused or surplus land constitute a real burden. Similarly, land of low fertility may be burdensome in that crops are so meagre as to hardly yield an income. Considering these factors, the abandonment of infertile farm lands is not to be viewed with alarm, but on the contrary is an economic result that must be generally beneficial, and particularly so to remaining farmers.

Recent reports indicate that the farm population of the United States has decreased from 32,000,000 in 1909 to about 27,500,000 in 1929. Unquestionably the development of farm machinery is reflected in this trend, and thus far, nitrogen has not been a controlling factor in farm population. The effect of the modern tractor and harvesting machinery upon labor requirements is obvious. While use of farm machinery affects primarily the ratio of labor per unit of cultivated area, and use of nitrogen affects primarily the ratio of crop yield per unit of cultivated area, the result in either case is a reduction

TABLE II

World Production of Inorganic Nitrogen, 1918 (Metric Tons of Nitrogen)

	By-products Processes	*Cyanamide Process*	*Arc Process*	*Synthetic Ammonia*	*Total*
Germany	120,000	70,000	...	215,000	405,000
U. S. A.	70,500	...	...	...	70,500
England	90,000	...	...	...	90,000
France	10,000	20,000	...	...	30,000
Italy	2,000	15,000	..	...	17,000
Norway	...	12,000	30,000	...	42,000
Canada	5,000	14,000	...	...	19,000
Japan	10,500	14,000	...	...	24,500
Chile	...	...	...	...	444,000
All other	35,000	35,000	...	...	70,000
Total	343,000	180,000	30,000	215,000	1,212,000

of labor per unit of crop produced. Therefore, even if it is assumed that the use of farm machinery has reached an economic limit (which is hardly true), a continued decrease in farm population is to be expected, due to the effects produced by the increased use of nitrogen. Such rationalization in agricultural industry should result in greater average profits per farmer, since there is every reason to expect a progressive increase in the consumption of farm products.

TABLE IV

Analysis of World Production of Nitrogen Calendar Years 1913, 1918, 1928 (Metric Tons of Nitrogen)

	1913	%	1918	%	1928	%
By-product	280,900	36.7	343,000	28.3	400,000	22.0
Cyanamide	32,600	4.3	180,000	14.9	221,000	12.2
Arc	15,000	2.0	30,000	2.5	30,000	1.6
Synthetic NH_3	7,000	0.9	215,000	17.7	675,000	37.2
Chile Nitrate	430,000	56.1	444,000	36.6	490,000	27.0
Total Inorganic N.	765,500	100.0	1,212,000	100.0	1,816,000	100.0

Nitrogen Prices

Prior to 1913 the supply of ammonia nitrogen was dependent primarily upon the by-product coking operations of the steel industry, rather than upon the demand for nitrogen. On the other hand, the supply of nitrate nitrogen, largely as Chile nitrate, was practically unlimited, and the price of the two forms of nitrogen was substantially on a par. During the war, nitrate nitrogen sold at a premium over ammonia nitrogen and this relationship has held throughout the succeeding period 1915–1929.

The price of ammonia nitrogen, as ammonium sulfate is at 10.7c per lb. and of nitrate nitrogen as Chile nitrate 13.4c per lb. Several comments may be of interest here. The present price of ammonia nitrogen is only 72 per cent. of the average price during the period 1902–1914. Assuming the 1929 general commodity price index to be 150 per cent. of the pre-war index, the corrected or "real" price of ammonia nitrogen is only 48 per cent. of the pre-war price. The corresponding actual price of nitrate nitrogen is 95 per cent. of pre-war, the corrected price being 63 per cent. of the pre-war price. Therefore, nitrogen in its two principal forms is relatively one of the cheapest essential articles of commerce, and no doubt this marked decrease in price is due largely, if not entirely, to the commercial development of the ammonia synthesis. Agronomists agree generally that much more nitrogen could profitably be used at present prices, and particularly so relative to the quantity of phosphoric acid now consumed, in order that a more balanced plant food may be applied to the soil. Thus, to adopt a policy of waiting for still cheaper nitrogen, is to forego substantial returns immediately obtainable.

It is of further interest to note that the present differential in price between ammonia nitrogen and nitrate nitrogen both in the United States and in Germany is equivalent approximately to the costs of oxidizing the ammonia and binding the resultant nitrate nitrogen. As progress is made in the art of ammonia oxidation, the present price differential may be reduced.

While price forcasting is at best a hazardous task, it is believed that the present low prices for ammonia and its derivatives will continue. The nitrogen industry of the future must be characterized by tremendous outputs, continued low prices and small profits, factors that are found in such basic industries as steel manufacture and petroleum refining.

Muscle Shoals and Fertilizer Nitrogen

As an emergency measure, the construction of the Muscle Shoals plants was fully justified, practically regardless of the cost. Furthermore, during the decade following the war, when the American nitrogen industry was developed from almost nothing to an industry of substantial commercial porportions, the existence of the Muscle Shoals nitrogen plants was justified merely as a form of national insurance. Therefore, the expenditure in the Muscle Shoals nitrogen plants has yielded a return exactly in the sense that expenditures for other defensive purposes, that is for the Army and Navy, is considered to yield a return.

To-day, however, the United States fortunately has attained a position where complete dependence and confidence may be placed in the nitrogen-producing facilities of private industry and consequently the Muscle Shoals plants are no longer needed as a means of national defense.

It is estimated that the United States production of nitrogen by the ammonia synthesis will be 80,000 metric tons in 1929 and 140,000 metric tons in 1930. The production of by-product nitrogen

TABLE III

World Production of Inorganic Nitrogen, 1928 (Metric Tons of Nitrogen)

	By-products Processes	*Cyanamide Process*	*Arc Process*	*Synthetic Ammonia*	*Total*
Germany	94,000	88,000	...	486,000	668,000
U. S. A.	145,500	...	...	24,000	169,500
England	90,000	...	...	50,000	140,000
France	20,000	15,000	...	40,000	75,000
Italy	3,500	10,000	...	30,000	43,500
Norway	...	10,000	30,000	...	40,000
Canada	5,000	33,000	...	...	38,000
Japan	10,000	20,000	...	30,000	60,000
Chile	...	...	...	...	490,000
All other	32,000	45,000	...	15,000	92,000
Total	400,000	221,000	30,000	675,000	1,816,000

should be at least 145,000 metric tons in 1929 and 150,000 metric tons in 1930. Therefore, in 1929 the total production of inorganic nitrogen should be 225,000 metric tons, or 60 per cent. Of the probable domestic consumption and in 1930, 290,000 metric tons, or about 70 per cent. of the probable domestic consumption. It is estimated that by the end of 1929 the total investment in the American nitrogen industry will be at least $45,000,000 and by the end of 1930, $70,000,000. These figures include investment in by-product nitrogen recovery plants, synthetic ammonia plants and plants for the conversion of part of the primary products to salable nitrogen compounds, e. g., sulfate of ammonia and nitrate of soda.

Our Nitrogen Independence

Various experts have estimated that the war-time nitrogen requirements of the United States would be 130,000 metric tons per year, which is only 58 per cent. of the estimated United States production for 1929 and only 45 per cent. of the estimated production for 1930. This, however, is merely an indication of our relative independence as to nitrogen. Of greatest significance is the fact that the American nitrogen industry could now if necessary, be expanded immediately and economically to any desired output, whereas in 1917 our lack of experience had to be paid for in terms of that precious asset—time, to mention nothing of the extraordinary expenditure of money.

The inescapable conclusion is that the Muscle Shoals nitrogen plants no longer have significance as to the national defense. Furthermore, it is believed that any expenditure designed to reconstruct or perpetuate these obsolete properties under the guise of cheap fertilizer nitrogen would in the end constitute a costly subsidy for which the farmer as well as other taxpayers would be forced to contribute.

The Congress has been criticised severely for failure to enact Muscle Shoals legislation, but after all, Muscle Shoals is probably less harmful securely entangled in red tape than it would have been released for the purpose of producing so-called "cheap nitrogen."

Norwegian Nitrogen Co., recently allied with I. G., is entirely transforming factories and production, according to the Department of Commerce. Without abandoning for the present its production based on the Birkenland and Eyde licenses, the company contemplates the application of the Haber process for synthetic ammonia, and of the Lilienroth process for manufacturing electrolytic phosphorus. The necessary installations are being introduced and probably will be completed by 1930, whereupon the capacity of production of the company will reach 80,000 tons of nitrogen compared with 30,000 tons produced at present.

Ministry of Commerce and Industry, Japan, plans to secure legislation granting subsidy to the artificial indigo industry for production on a larger scale than at present. Annual production of 1,000 tons is desired for domestic demand and it is planned to increase this to 3,000 tons with a view towards exporting the surplus to China.

Science and Sales

An ink, which has for its special property almost immediate penetration into ordinary paper, is made from water, glycerol or glycol together with two to ten per cent. of an ester of a polyhydric alcohol, for example glycol acetate or glycerol acetate and also contains gelatin, dextrin, gum arabic, etc. British Patent No. 303,200.

A new type of resin is obtained from glycerol or other polyhydric alcohol heated in a mixture with an organic acid and a vegetable oil or a blown vegetable oil or fatty acids, such as a mixture of glycerol, phthalic acid and tung oil, the resin being miscible with nitrocellulose. United States Patent No. 1,690,515.

Lignite coal tar is claimed to be a superior product for the impregnation of paper and cardboard for the production of waterproofed products because they do not contain the bad-smelling naphthalene found in coal tar, and because they contain technically valuable paraffin. German Patent No. 459,765.

Carbon dioxide is employed for the decomposition of gas botained from the destructive hydrogenation of coals, tars, mineral oils, etc., either alone or in association with steam or other gases not richer in oxygen than air. British Patent No. 279,072.

A dilute alkaline solution of lead oxide, with or without the addition of sulfur is used as a reagent in the after-treatment of petroleum distillates, refined with the aid of sulfur dioxide, to obtain products with improved odors. British Patent No. 301,955.

Hydrochloric acid is used to improve flour by subjecting the latter in the wheat, intermediary or final milled stages to the action of heat. Lactic, acetic or phosphoric acid may be used in the place of hydrochloric acid. British Patent No. 300,568

Anhydrous zinc chloride is produced by treating zinc oxide at a temperature of 400 to 500 degrees C with chlorine in the presence of an excess of a mixture of hydrogen and carbon monoxide. British Patent No. 288,253.

It has been found that the presence of a manganese soap and hexamethylenetetramine considerably accelerates the oxidation of paraffin hydro carbons by gasses containing oxygen. *British Patent No. 298,704.*

Solid polymerized formaldehyde is made by treating the aqueous product with sodium carbonate below 50 degrees C in absence of gelatinizing agents such as alkaline soaps. British Patent No. 303,258.

Lead tetraethyl with ethylene dibromide may be used to prevent the partial decomposition and oxidation of mineral and vegetable lubricating oil when added to the oil itself. British Patent No. 295,230.

New flotation oils for separating minerals, coal and the like are made from montan or paraffin wax by oxidation at an elevated temperature. *British Patent No. 298,736.*

Butaldehyde is heated with a phenol, preferable in the presence of hydrochloric acid, to produce an artificial resin. United States Patent No. 1,667,872.

A solution of a soluble titanium salt is employed for the delustering of rayon. United States Patent No. 1,692,372.

Does the Chemical Industry Need

AN AMERICAN CARTEL

To Meet Competition from Europe?

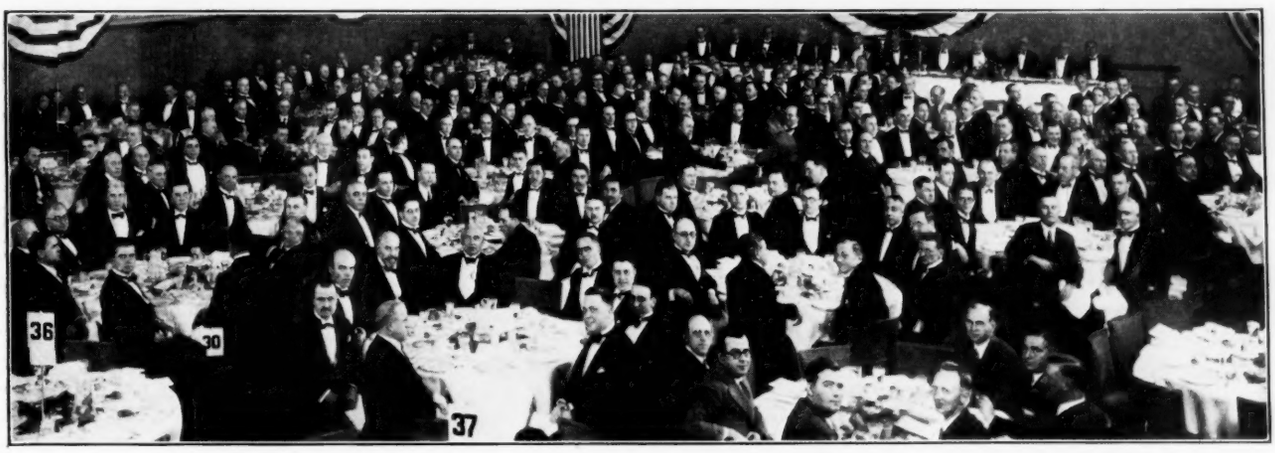
By Col. William J. Donovan

AMERICAN industry has at its command certain protective measures to enable it to meet the challenge of foreign momopolies and cartels. It has been demonstrated that foreign monopolies or foreign cartels, when they come into this country to carry on their business operations, must recognize that the principles of the antitrust laws may be made binding upon them. The provisions of the antitrust laws, together with a protective tariff on certain competitive products, constitute measures of defense which have evidenced their potency as shown by the coming here of the I. G.

It is understandable that there should be objections raised to this concern coming into this country. But when, as in this case, the foreign corporation erects plants and invests capital in our country, then its operations and the acts of its executives become subject to our laws, and for the purpose of applying the principles of the Sherman Act we are in a much better position to deal with the foreigners than if they remained entirely abroad and projected themselves into our territory from foreign soil.

It would also be unfair to deny to foreigners in our country the right that our citizens are asserting in their country. We cannot expect to establish plants owned by American capital in foreign countries for the better distribution of surplus production abroad and at the same time undertake to exclude foreigners from establishing plants and distributing agencies here. Many of our industries have hurdled the customs barriers of other countries, and subjected themselves to their laws and have set up plants within the walls. International Harvester, American Radiator, General Electric, General Motors, and Ford, together with others, have done this. It has been done for practical business reasons. We can hardly deny this right to those who, because of business advantages to them, are willing to subject themselves to the requirements of our laws.

The chemical industry is especially concerned with the problem of a surplus that comes of over-production. I know that you have sought to solve that problem by consolidation and combination. This trend has been quite manifest during the past year. I do not undertake to pass upon the business wisdom or legal validity of these mergers. But there is, of course, a limit to which you may go in this direction. I think it well for all of you to keep in mind certain



A view of the Sixth Chemical Industries Banquet at the Hotel Roosevelt, New York, May 9, at which time Col. Donovan delivered the address from which this article has been abstracted. At the speaker's table (left to right) are A. Cressy Morrison, Arthur D. Little, Frederick E. Breithut, Samuel W. Parr, August Merz, William J. Donovan, Ralph E. Dorland, Charles C. Concannon, L. V. Redman, Herbert H. Dow, Charles H. Herty, and Williams Haynes.

principles. The law recognizes that competition may be carried to an extreme, that it may produce effects dangerous to economic society. It is believed that consolidation may in some degree correct the evils of destructive competition and that it represents an effort to adjust the relations between production and consumption, supply and demand. It is when these consolidations attempt to eliminate competition, to enhance existing prices, and to exercise permanent control in the industry that they constitute violations of the law.

The anti-trust laws were not directed at the prevention of all consolidations. As pointed out in the report of the Industrial Commission in 1902, consolidations which seek only to secure advantages that come from economical management, and which do not seek to dominate the particular industry, are but the natural development of a form of organization adapted to meet modern conditions and are necessary to our industrial growth. A very recent report published by the Industrial Conference Board on "Mergers and the Law" reaches substantially the same conclusions.

Organization of a general chemical export association to enable American manufacturers to meet on more even terms the large European chemical cartels, is herein advocated by Col. Donovan. He points out that the industry is not taking advantage of the opportunities offered by the Webb Act to combine to meet competition in foreign markets. A complete discussion of this law and its possibilities, prepared by Dr. William Notz, one-time senior economist of the Department of Commerce, will appear in an early issue of CHEMICAL MARKETS

The general development in this country of large business corporations has too often been mistakenly interpreted as evidence of failure on the part of the government in the policy of repressing monopoly. The term "trust" is often ascribed to large corporations, which, in point of fact, do not control a sufficient proportion of the business to enable them to dictate prices or to hinder the free development of rival enterprises. The law does not make the mere size of a corporation, however impressive, or the existence of unexerted power on its part, an offense, when unaccompanied by unlawful conduct in the exercise of its power.

However, those consolidations which either have the intent to monopolize or which, as a direct or natural consequence of their organization and practices, result in a monopoly are condemned as a violation of our law. To determine whether there is evidence from which there may be inferred an intent to violate the law, the court has indicated certain tests which usually characterize a combination seeking to establish industrial domination. These are primarily — lowering of wages to the workmen; unfair practices against competitors; deterioration in the quality of the product, and excessive prices to the consumer.

In the foreign field your industry will always desire to develop its markets. I have no doubt that you will always have before you the problem of the distribution of your chemical production more efficiently in other fields.

There is affirmative legislation at hand which gives American industries the opportunity to do business in foreign countries on an equal footing with foreign competitors. This legislation is known as the Webb Export Trade Act, enacted in April, 1918.

The immediate cause for the enactment of this statute was a report of the Federal Trade Commission investigation into foreign trade conditions, submitted to the Senate on May 2, 1916. The Commission found that foreign nations had certain marked advantages in foreign trade from superior facilities and more effective organizations, and the fear of the restrictions of our anti-trust laws prevented Americans from developing effective organizations for overseas business. In the report it was pointed out that American manufacturers and producers must meet aggressive competition from powerful foreign combinations, often international in character.

It went on to say that "it was against such organizations as these, uniting powerful groups of foreign concerns, backed by great banks, aided by railway and ship lines, and vigorously assisted by foreign Governments, that hundreds of comparatively small American manufacturers and producers must compete for trade beyond our shores." The result was that Americans suffered rigorous competition from powerful foreign combinations; they were forced to expose the secrets of their over-seas business to their foreign competitors and to risk effective discrimination against their trade through dependence on foreign cables, telegraphs, banks, and ships. In addition, American manufacturers and producers had to deal with highly effective combinations of foreign buyers. The report pointed out that if Americans were to enter the markets of the world on equal terms with their organized competitors and their organized customers, if they were to expand their foreign trade and obtain their rightful share of foreign business on profitable terms, they must be free to unite their efforts. Only strong

organizations could undertake the test. If groups of American manufacturers and producers, however, either competing or non-competing, could combine their efforts, they could share the cost of developing new markets, could establish themselves firmly, could assist in the financing of foreign enterprises, could more readily extend credit to foreign customers, and could compete more successfully with foreign syndicates and cartels.

During the course of the debate, two chief dangers from these export organizations were pointed out. The first was that they might by used to expolit the home market, and second, they might be used unfairly against individual American exporters in foreign trade. However, it was felt that the law could provide against these evils without sacrificing the essential advantage of joint action; and finally, in order to clarify the antitrust laws, this Export Act was passed, not so much as an amendment to the Sherman Law, but as a declaration on the part of Congress that the Sherman Act did not prevent Americans from co-operating in export trade for the purpose of competing effectively with foreigners where such co-operation did not restrain trade within the United States, did not prejudice the interests of the American public, and where no attempt was made to hinder American competitors from securing their due share of the trade.

It will be noted that chemical products, such as caustic soda, soda ash, liquid chlorine, soda pulp, paints and varnish, were exported to the value of $3,100,000; while raw materials such as phosphate rock, crude sulfur, etc., amounted to $14,300,000. This totals about $17,000,000. Compare this figure with the total value of exports of strictly chemical products. We may safely put this at $200,000,000 annually. Then consider the opportunity that is open to increase the volume of exports handled through an association organized under the Webb Export Trade Act.

It would seem, that there is still a great opportunity for your industry in the organization of a general chemical export association, in order that with a united front and in fulfillment of the purpose of the Act itself, you might meet on more even terms the very large chemical organizations represented by the Imperial Chemical Industries, Ltd., of England, and the Kuhlmanns of France.

Such an organization, furnished with the direction that could come from your industry, might well be a solution of the problem of disposing of your surplus chemical production more efficiently in foreign fields.

So then, in the present state of the law, there is at your hand an instrumentality which, while it provides the fullest play for the maintenance of American business initiative, also affords the means for that concerted action through which industry can compete even more successfully in foreign markets.

Who's Who In Chemical Industry

Kessler, John M., president and treasurer, The Kessler Chemical Co. Born, Germany 16 Dec. 1882; mar., Florence V. Pettit (died 1919); children, two; educat., Heidelberg and Munich Univ., Ph.D., 1906. E. de Haën, 1906-08; Continental Pegamoid Co., 1908-10; E. I. du Pont de Nemours & Co., 1910-20; Kessler Chem. Co., 1920 to date. Memb. Amer. Chem. Soc., Soc. Chem. Ind., Verein Deutschen Chem., and Chemists' Club. Address: Kessler Chemical Co., 575 Nassau St., Orange, N. J.

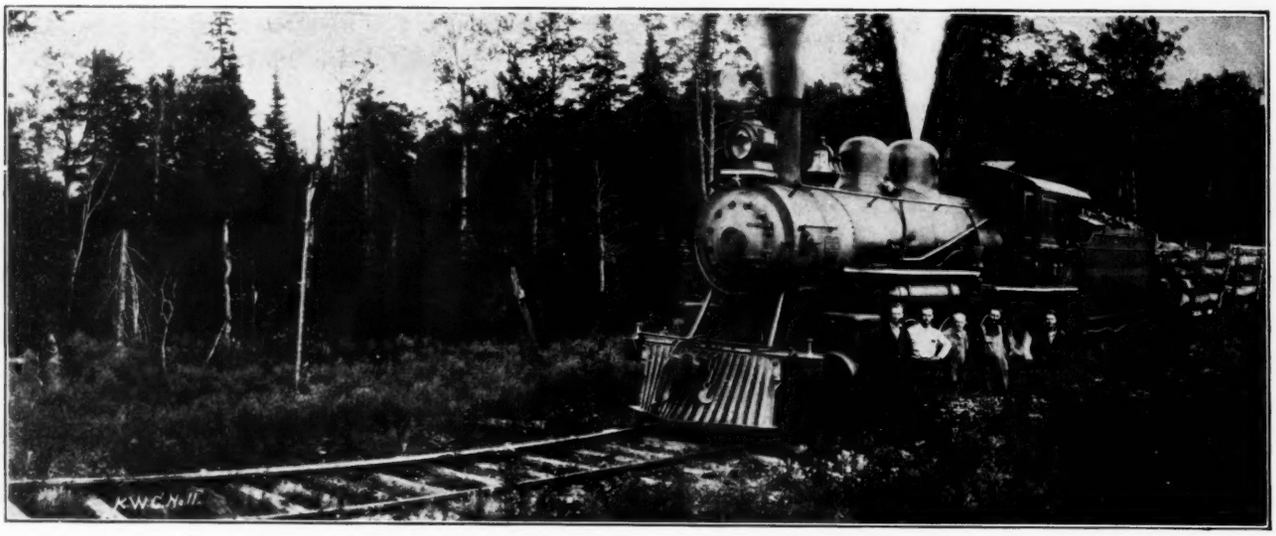
Lincks, George H., "gum specialists." Born, Jersey City, N. J., 7 June 1871; mar., Grace E. Swenarton (dec. Oct. 1918), 2d, Susan Hunt, New York City, 17 Oct. 1925; children, 1 dau., 1 son; educat., Jersey City publ. schls. Baker & Williams, warehouseman, 1886-89; Wm. H. Scheel, gum merchant, 1889-1920; started own business, 8 Mar. 1920. Assembly candidate N. J., 1916. Author of "The Grass Tree Gum of Australia," "The Story of Kauri Gum," "Resins for Lacquers and Their Solvents." Clubs: Paint & Varnish (N. Y.). Hobbies: gardening, reading. Address: 123 Front St., New York City.

Moody, Sidney Clarke, sales department manager, The Calco Chemical Co. Born, Evanston, Ill., 13 Nov. 1895; mar., Frances T. Glenn, Montclair, N. J., 7 May 1924; children, 1 dau.; educat., Williams Coll. A.B., 1917. The Calco Chemical Co., 15 May 1919, to date. U. S. Army 1918-19. 2d Lt., Field Artillery. Memb., Salesmens' Assn. Chem. Ind., Zeta Psi Ph Beta Kappa, Williams Club. Hobby; golf. Address, Calco Chemical Co., Sales Dept., Bound Brook, N. J.

Reeve, Charles Snyder, chief chemists, Development Department, The Barrett Company. Born, Phila., Pa.; mar., Elizabeth A. Gumpert, Phila., Pa., 7 Mar. 1907; children, 1 son, 1 dau.; educat., Univ. Pa., B.S. (Chem.). General Electric Co., asst. chem.; Industrial Water Co., chem. engr. Phila. Bureau of Surveys, chem.; asst. inspr. of Asphalt & Cement, Dist. of Columbia; U. S. Bureau of Public Roads, chem. Published papers on testing and use of Bituminous matls., toxicity of wood representatives, etc. Memb., Masons, Delta Tau Delta, Amer. Chem. Soc., Soc. Chem. Ind., Amer. Inst. Chems (Fellow), Amer. Wood Preservers Assn., Amer. Soc. Test. Mätls. Clubs: Chemists' N. Y. Fraternities. Hobby: radio. Address: The Barrett Co., 40 Rector St., New York City.

Robins, George Stanley, president G. S. Robins & Co. Born, Brooklyn, N. Y., 1 Oct. 1892; mar., Bessie Alpaugh, Plainfield, N. J., 11 Sept. 1915; children, 2 sons; educat., Rutgers Coll., B.Sc., 1913. Churchill Drug Co., 1914; A. S. Barada & Co. 1915-16; Thompson-Munro-Robins Chem. Co., vice-pres., 1917-23; G. S. Robins & Co., pres., 1923 to date. Memb., Delta Upsilon, Phi Beta Kappa, Amer. Chem. Soc., (chmn,)St. Louis Sect. 1927), St. Louis University Club. Hobbies: baseball, tennis. Address: G. S. Robins & Co., 310 S. Commercial St., St. Louis, Mo.

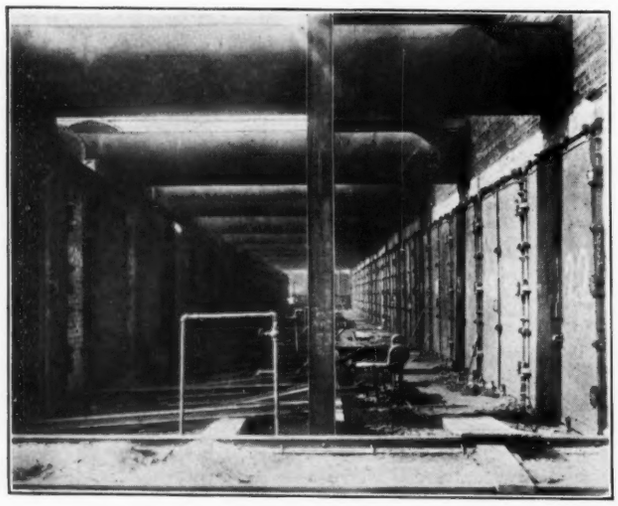
Rose, Robert Evstafieff, director Technical Laboratory, E. I. du Pont de Nemours & Co., Inc. Born, Palermo, Sicily, 2 June 1879; mar., Glenola Behling, Aug. 1915; educat., Leipzug, Ph.D., 1903. Univ. of Wash., asst. prof. chem., 1907-17; Mellon Inst., Fellow, 1917; E. I. du Pont de Nemours & Co., Inc., 1918 to date. Inventor of a new line of spirit soluble dyestuffs. Memb., Soc. Sigma Xi, Phi Lambda Epsilon, Amer. Chem. Soc., Amer. Inst. Chem. Engrs.; Amer. Assn. Adv. Sci.; Soc. Dyers & Colorists, Amer. Assn. Textile Chem. & Colorists. Hobbies: bugs, gardening. Address: E. I. du Pont de Nemours & Co., Box 518, Wilmington, Del.



Modern Wood

By M. M. Quinn, *Secretary, Keystone*

UNTIL recent years, practically the only progress which had been made in the wood distillation process itself, was in the use of the oven retort. Practically everyone is familiar with the progression from the old-style kilns to the cylinder retort, and finally to the present successful oven retort. In the last few years, more attention has been paid, especially in the larger plants, to the control of heat in the retorts, to the burning of tar as fuel, and to the better utilization of wood gas as a fuel. Probably the greatest step forward in the last few years has been towards the extraction of acetic acid direct from the pryoligneous liquors.

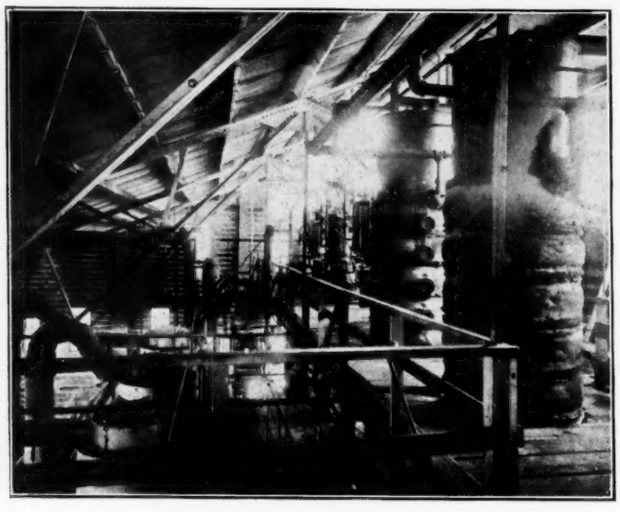


From the pre-driers shown on the left, the wood is charged into the retorts at the right of the picture.

Perhaps the outstanding example of all that is most modern in the wood distillation industry may be found in the new plant of the Keystone Wood Chemical and Lumber Corp., at Glenfield, N. Y., the scene of the largest wood distillation operation in the world. From that point, the company operates twenty thousand acres of virgin hardwood land to the west of Glenfield, and forty-two thousand acres of virgin hardwood land east of Glenfield, utilizing forty-five miles of main-line and spur tracks to do this.

A large double band hardwood saw mill is operated in connection with the chemical plant. This permits of economic operation of the timberlands as all trees are cut into log lengths, irrespective of whether they are defective or not and a selection is made at the saw mill of the merchantable timber which will manufacture good hardwood lumber.

The defective logs are sorted out and cut first into four-foot lengths, then split and cut into 12 foot blocks for utilization in the wood distillation plant. The limbs from the trees and timber too small for lumber are cut into 52-inch lengths in the woods and



An interior view of the still house giving a close-up of the dealcoholizers.

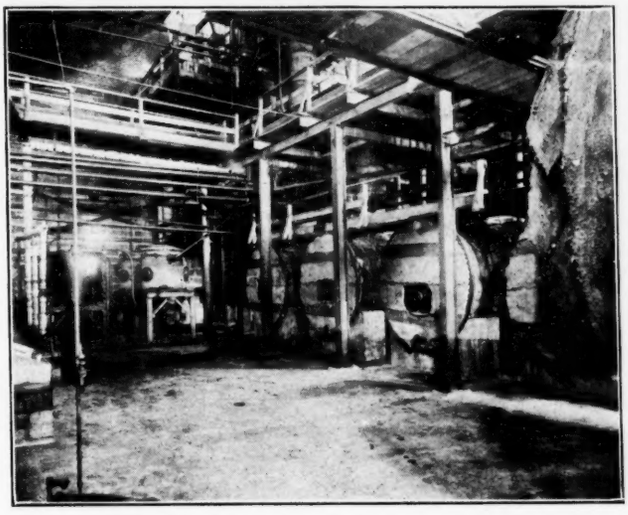
Distillation

Wood Chemical & Lumber Corporation

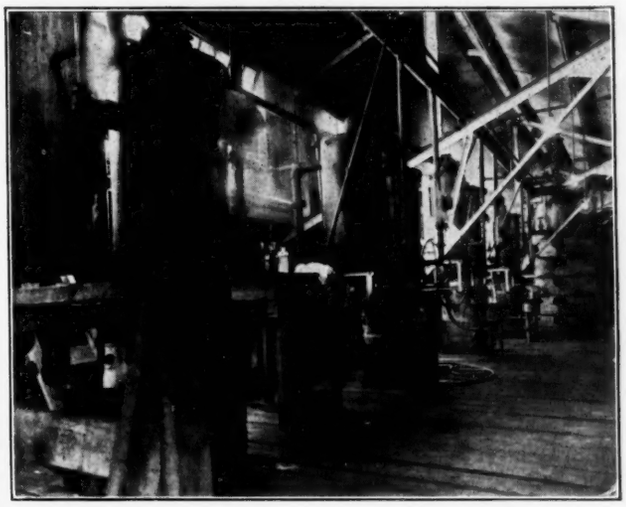
transported as such to the plant for chemicals. Thus, there is no wasteage of timber such as usually follows up a hardwood saw mill industry.

The saw mill is a double band mill with vertical re-saw and is the latest design machinery available. It is operated almost entirely by electricty manufactured by the company at its central power plant and each machine is driven by its own individual motor. The wood mill is a part of the saw mill proper and is so located that logs which are partially defective can be utilized insofar as possible for lumber and the remaining part of the log readily converted into chemical wood.

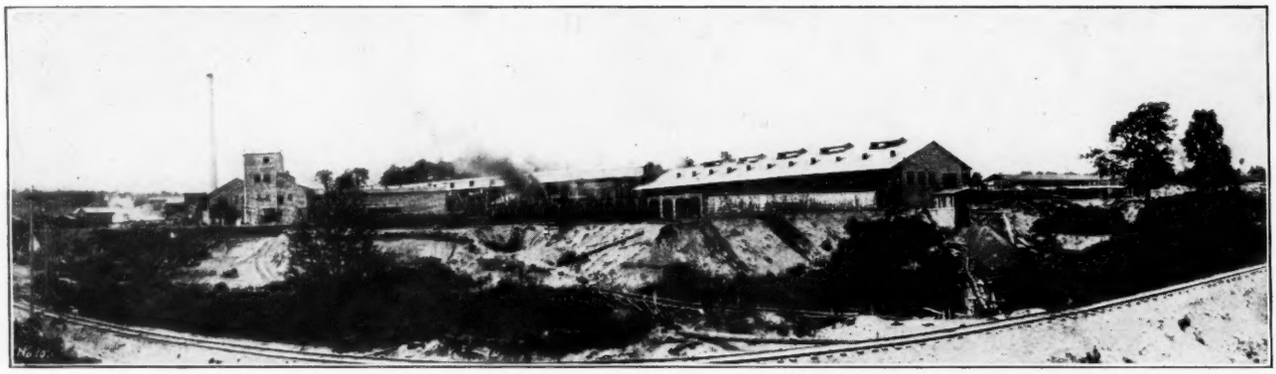
The wood distillation plant proper is of 220 cords daily capacity consisting of twenty-two 10-cord oven-type retorts. The retorts, themselves, have rather a unique setting; that is, they are supported from underneath with steel flues over the top of the retorts and the entire tops of them insulated, first, with fire felt and then with 85 per cent magnesia, thus permitting of an appreciable fuel saving over the older type plants where the acetate kilns are located directly above the retorts. The retorts are fired only from one end and on account of this are provided with a system of timber controls so that the heat at each end of the retort can be positively regulated. All wood is green when delivered to the plant and, therefore, it is necessary to pre-dry it. This is done with eleven double pre-driers holding sixteen two and one-half cord trucks each. The waste heat is drawn from the retort flues by eleven large fans. These fans force the heat in at one end of the pre-drier and it passes out through stacks on the opposite end, carrying with it the excess moisture from the wood. The wood is delivered from the mill and loaded into retort trucks through a hopper so that



Another view of the still house interior, showing the acetic acid stills.



The acetic acid condensers shown here play an important part in the modern process.



An exterior of the Keystone plant giving an excellent view of the pre-driers, retort building, wood conveyor and still house.

no manual labor is required for loading more than one-half of the daily production of the plant. It passes from the mill on a 24-inch rubber canvass belt, 1,100 feet long, manufactured especially for that purpose. At the opposite end of the retorts are located the twenty-two primary coolers and the twenty-two secondary coolers. The charcoal is pulled from the retorts and the wood is charged from the pre-driers into the retorts and the charcoal is removed from the first set of coolers, all at one operation by use of shafting driven by motors. Continuing from the coolers are charcoal loading docks and charcoal storage buildings.

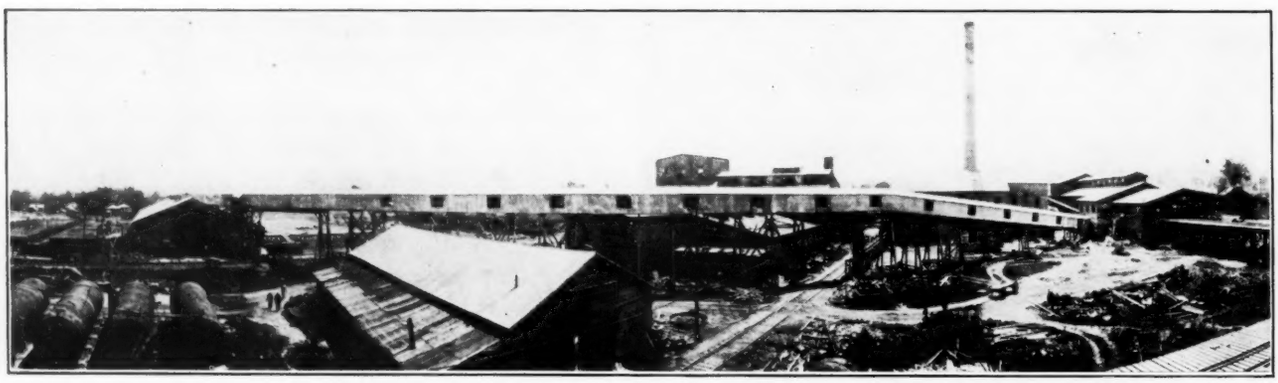
All trucks are handled at the pre-driers and at the coolers over transfer tracks. The switching yard, such as is used in smaller plants, would require too much space here because of the number of retorts.

The retorts are set enbloc, that is, there is no spacing between the retorts. This is done both to utilize space and, also, to economize in the use of fuel. Each retort has but one condenser, this being set directly in the center of the roof of the retort. All water lines, wood gas lines and liquor lines are installed over the center of the retorts so that each one is readily accessible for repairs. The wood gas is drawn from the retorts by a high speed exhauster, motor driven, and the gas forced through double scrubbing takers to an expansion tank and from thence to the boilers for fuel. In doing this some acetic acid and methanol is re-claimed, and also, a cleaner wood gas for burning is procured. The retort building is entirely fire-proof, being constructed of concrete, brick and steel with a corrugated asbestos roof. The still house is a tile and steel building with asbestos roof and is entirely fireproof. The main building consists of three floors and the extraction building of four floors. Located in this building is all of the necessary apparatus for dealcoholizing the pyroligneous liquors and then by direct extraction re-claiming the acetic acid and rectifying it to a commercial product. Adjacent to the still house is a shipping building and methanol storage tanks.

The power house contains a 500 H. P. engine used for driving the head saws in the mill and a 780 K. V. A. steam Turbo generator for supplying electrical power for the entire plant. The water is provided by three centrifugal electrically driven pumps at the nearby river.

The boiler house contains 1850 H. P. of fire tubular boilers. The boilers are fed automatically with waste fuel from the saw mill during ten hours of the twenty-four and during the remaining fourteen hours are hand fired, although arrangements are being made for automatic firing at all times.

The company maintains its own fire organization, having eight-inch cast water mains throughout the plant area which are supplied with high pressure water from two pumps capable of pumping 1500 gallons of water per minute. It also maintains all of its electric power lines as well as a complete machine shop and electrical repair department A superintendent is in charge of each department and the plant in general is supervised by a general superintendent and an assistant general superintendent.



Another view taken from sawmill lumber docks showing retort building at left, conveyor from sawmill to retorts, still house and sawmill.

MARKETING RAW MATERIALS

By James L. Palmer
Assistant Professor of Marketing, University of Chicago

Of paramount interest and importance to all who have chemicals to sell is the discussion of the particular problems involved in marketing raw materials. Price cutting, discrimination and other unfair competitive practices are only too prone to result during periods of overproduction or poor business in a standardized market of this sort in which competition is practically limited to a price basis. Professor Palmer points out that solutions to the troubles of the raw material industries, lie within the industries themselves.

MARKETING problems of manufacturers of raw materials consumed by industry are essentially the same as those of manufacturers of so-called consumers' goods. Products must be well adapted to market requirements. Effective methods of selling and promotion must be employed. Satisfactory agencies of distribution must be secured. Economical methods of distribution must be found and at the same time excellent service must be rendered to customers. Prices must be established and price policies worked out which meet with the approval of buyers and at the same time permit of a reasonable profit to the manufacturer.

Yet there are certain characteristics of raw material marketing which distinguish it significantly from the marketing of most consumers' goods, and which result in differences in marketing methods. In the first place the manufacturer of raw materials produces as a rule a standardized commodity which is often bought on specification. The buyer is typically a well informed purchasing agent or plant executive with precise knowledge of his requirements, and often equipped with testing facilities by means of which he can assure himself that specifications are being met. As a consequence it is extremely hazardous and usually futile for the seller to resort to the many subtle techniques which characterize the advertising and selling of commodities to the ultimate consumer. To the extent that buyers can intelligently appraise the offerings of sellers just so far must competition between sellers fall back upon price. The low ratios of selling and advertising cost to sales which seem to prevail among sellers of raw materials are undoubtedly due in part to the fact that buyers are not responsive to sales effort. "High pressure" salesmanship certainly has very little place in the marketing of raw materials, simply because it will not work.

On the other hand, there are many buyers of raw materials who for one reason or another are not guided in their purchases by thorough knowledge of products, markets and sources. Purchasing agents of small concerns are often of this type. The writer recalls a case in which a skilful salesman secured a premium of two cents a pound over the market on a 90,000 pound order from such a buyer. Clever salesmanship and advertising, coupled often with distinctive branding, make this sort of thing possible. Whether or not it is good long-run sales strategy is for the individual concern to decide. It is doubtful whether anyone can take such a product as sulfuric acid and by such devices as packaging, branding and advertising obtain for any length of time a premium over the current price. Yet this often can be done in marketing basic products to consumers.

In the purchase of raw materials strictly rational buying motives prevail. The buyer is concerned about quality, dependability of supply, rigid adherence to specifications, and economy. As a consequence it is essential that the seller so construct his organization as effectively to appeal to these motives. Chemical control over plant operations is extremely important if a product of uniform quality is to be placed on the market. The writer recalls the case of a glue manufacturer who for years experienced difficulty in marketing because of failure to establish control over factory operations. As a rule uniformity in the product is absolutely essential to its satisfactory use, and no amount of sales effort will enable a manufacturer to offset the effect of a reputation for making a product which cannot be depended upon in this respect. It is also extremely important so to set up the machinery of distribution as to be able to fill any order on short notice. When a retailer cannot secure a product promptly the loss is usually slight but when a manufacturer runs out of a basic raw material the consequences are often severe. The difficulty faced by raw material manufacturers in finding distinctive patronage motives argues strongly for capitalizing upon this possibility. One way to overcome price competition is to establish a reputation for exceptional service in supply.

The fact that buyers of raw materials operate to earn a maximum net profit of course tends to place competition among sellers on a price basis. Assured a reliable source of supply and an agreed upon quality of material the buyer is concerned primarily about price. As he is typically well informed about market conditions and products he can readily detect price differentials. Hence the seller must be able to meet competitors' prices under all circumstances. This of course places great stress upon economy in both production and distribution. As a rule it is not possible, as in some lines of business, to secure higher prices than competitors. Profits depend primarily upon the costs of operation, not upon skilful manipulation of selling price. This of course argues very strongly for careful analysis of all marketing operations. Transportation and warehouse costs must be kept at a minimum. The most economical means of transportation and storage must be employed. Organizations must be constantly on the lookout for improved methods. If a saving can be effected by substituting motor truck for rail transportation, or by distributing through public warehouses rather than one's own branches the change must be made, assuming service can be maintained. Market areas must be carefully defined and subjected periodically to thoroughgoing cost analysis. It is a rather unusual concern which knows all that it profitably might about distribution costs. In the marketing of bulky, low-value products heavy losses may be sustained in event of failure carefully to define profitable areas of market operation. The temptation is constantly present to expand volume without regard to cost, and the effect often is to reduce net profit and disrupt trade conditions generally. Similarly, manufacturers often fail to distinguish between profitable and unprofitable accounts, and as a consequence will sell anyone and in any quantity. Occasionally this practice of indiscriminate selling has absurd consequences, as witness the case of a manufacturer of a certain chemical selling nationally, 95% of whose business was sold in L. C. L. quantities. This concern and most of its competitors were losing money, while the one profitable establishment in the industry was concentrating its efforts on carload buyers. The latter analyzed its market; the former did not. Selective selling is sound strategy in all lines of business; it is particularly important in industries in which the costs of physical distribution or of selling are high.

Inelastic Demand Prevents Increased Sales

Many raw materials have a relatively inelastic demand. In such cases it is difficult either through sales effort or through price reduction to stimulate consumption. A reduction in the price of sulfuric acid will have little or no effect on the consumption of storage batteries; hence little or no effect upon the quantity of sulfuric acid sold. When demand is inelastic price reduction does not stimulate purchases to such an extent that the added volume of business offsets the loss caused by the decline in price. At the same time the temptation constantly confronts the individual firm to cut prices because of the immediate effect of a lower price in attracting business to itself. Competitors usually must meet such situations by making similar price reductions. The net effect is a lower price level for all, and no substantial increase in volume for anyone. A condition of this kind is particularly apt to develop in an industry with excessive plant capacity or one in which there are many small or backward concerns which do not know their costs of production and distribution. A large number of raw material industries have suffered from it during the past decade. Time alone can legally dispose of the excess capacity factor. Co-operative action alone can combat the influence of the competitor who has no regard for costs. A failure to co-operate may and often has thrown industries into a chaos of price cutting, inside prices, secret rebates and sundry forms of unfair competition. The only way out of such a situation other than to let time take its course is through trade association activity or consolidation. Offending concerns may be either educated or absorbed. Either expedient is apt to be only partially effective. Of course there are legal limitations to the extent to which either expediency may be employed. There are certain marketing problems which can be met only by industry action. If as a result of overcapacity, ignorance of costs or the pressure of competition the price level of an entire industry is lowered below cost it is of little avail for a single manufacturer to try to combat the situation. The industry as a unit must act and take such measures as it may within the law. There is little doubt but that a major cause of the present trend towards mergers and consolidations is to be found in the necessity for some degree of control over supply and for economy in distribution. Both of these are important in any industry; they are particularly important in an industry the product of which has an inelastic demand.

Sales Effort Unavailing

Demand for many raw materials is not only relatively inelastic but it is not readily subject to expansion. Buyers not only do not respond substantially to price change but are also comparatively indifferent to product sales effort. In short it is often difficult to increase the consumption of raw materials. Leather serves as an excellent illustration. The consumption of leather depends upon the consumption of shoes and other leather products. Hence the quantity sold is dependent primarily upon the ability of the shoe and other leather products industries to increase the demand for their products. It does not follow, of course, that the leather industry is altogether powerless to influence the demand for leather. It may accomplish something by advertising the merits of leather as over against substitute products; or it may even co--operate with industries using leather by

advertising to increase the consumption of their products. But it is nevertheless true that it has less control over demand than does the average industry selling products for use by ultimate consumers. If it happens that the industries using its product are not alert and aggressive a rather serious predicament may develop for the raw material producer. Of course it is always possible for the individual manufacturer of raw materials to build up demand for his own product through well organized sales effort. But this is done at the expense of competitors in the industry unless the demand for the product of the industry is at the same time stimulated.

Importance of Research

An industry which finds it difficult to increase the consumption of its product in existing uses may still find a solution for its problem in other directions. It may, for example, conduct research for the purpose of discovering new uses for its product. This has been done in some measure by the glue industry. There seem to be excellent possibilities here also for manufacturers of dyes, as a result of the willingness of consumers to accept color in a great many products in the sale of which the color appeal has not previously been employed. In some cases it is also possible to increase consumption by accelerating the rate of obsolescence for finished products. The introduction of the style factor into a product like furniture, to the extent that it causes furniture to be discarded before it is actually worn out, presumably increases the consumption both of furniture and the raw materials used in its manufacture.

But there are no doubt products into which style cannot be introduced to advantage and for which new uses cannot be found. In such cases, and in the event that demand is not highly responsive to price change, the solution for the seller lies in the control of supply and in the reduction of costs of production and distribution. Consolidation or co-operative action within the industry—assuming no violation of trust laws—will give better results than large advertising and selling appropriations or price cutting.

Many raw materials are of a highly technical character and have numerous widely different uses. Animal glue is a case in point. It is produced in different grades and types, has various more or less satisfactory substitutes, and is used by many different industries; in woodworking industries for joint work and veneering; in paper manufacture for sizing and coating; in the manufacture of kalsomine; in the manufacture of various chemicals, etc. In order to do a first-class job of selling it is necessary to know the chemical properties of the various types and grades of glue and substitute products, and to possess a thorough working knowledge of the various uses to which these products are put. Many users of glue operate on a small scale, have had a very limited experience in the use of glue and have no facilities with which to carry on their own experimentation. Typically, users are not in a position to know as much about the product as does its manufacturer. As a consequence the latter has an excellent opportunity to build a successful marketing program around technical service to the user. Various problems of course arise in doing this. Costs must be kept at a reasonable level. Salesmen must be very thoroughly trained and must be supported in the field by technical experts who must be so equipped as to be able to take the initiative in solving any problem of a customer or prospect involving the use of adhesives. What is true of glue in this respect is also true of many other products purchased by industrial concerns. During recent years a great many notable sales successes have been realized by manufacturers of raw materials through the development of technical service activities. This line of endeavor is particularly apt to be fruitful in raw material marketing because of the tendency of competition to fall back upon price, and of the possibility of offsetting this tendency by rendering unusual service to the buyer.

Price Situations

Most of the characteristics of raw material marketing which have been discussed react in some way upon the price situation in the market. The standardization of commodities, the fact that buyers are well informed and technically minded, and the keeness of competition tend to cause sales transactions to turn squarely upon the question of price. In theory such conditions would produce a stable market in which all sellers quote approximately the same price, that price being slightly in excess of the cost of production. In practice, on the other hand, it is often to the immediate interest of an individual concern to quote prices lower than average cost. Then, too, as has been pointed out, there are numerous concerns which do not know their costs and which are willing to sell at any price which will secure business. Under strictly competitive conditions it may pay, in the short run at least, for an individual concern to take business wherever it may be found and at whatever price it may be obtained. Such being the case it is not surprising that many raw material industries have during periods of overproduction or poor business been characterized by ruthless price cutting, discrimination and all sorts of unfair competitive practices. Some of the consequences of this, and possible methods of solving the problem have already been discussed. Unethical practices or unfair competition can be eliminated only by legal procedure or by voluntary co-operative action within an industry. The grocery trade has recently experienced both measures. Through co-operation it has been trying to get its members to agree to adhere to ethical trade practices. At the same time one of its members recently carried a case to the Supreme Court in a successful effort to compel a supplier not to discriminate unfairly in price between customers.

Raw Material Marketing -- Summary

The more important aspects of raw material marketing may be briefly summarized as follows:

(1) Products are typically standardized and purchased by men who are able and well informed, hence not susceptible to "clever" salesmanship. Facts and reason alone count in dealing with them. Consequently all sales effort must be maintained on a high level.

(2) Rational buying motives prevail in the purchase of raw materials. The buyer is interested in net profit and the seller's problem is to relate his proposition to this objective. The marketing policies of the seller must be geared at every point to the operating requirements of the buyer.

(3) Competition in the sale of raw materials tends to be on a price basis. Ordinarily the only means by which a seller may maintain his price above the market is through service. As a consequence the machinery of marketing should be designed chiefly with regard to economy and service of the highest attainable quality.

(4) Raw materials are frequently bulky and expensive to transport and store. Hence it is particularly important to define market areas carefully and analyze distribution costs in such a way as to discover unprofitable fields of operation.

(5) The demand for many raw materials is elastic and not readily susceptible to expansion. Hence consumption cannot be substantially increased either by price reduction or by aggressive sales effort. It does not follow that an individual concern cannot increase its volume by efficiency in selling. Price cutting by one firm, however, merely encourages similar reductions on the part of competitors, the net effect being to the advantage of no one in the industry.

(6) When demand is inflexible and inelastic there is a strong tendency towards co-operation and consolidation for the purpose of maintaining stability in supply and eliminating unethical or poorly advised practices. Thus economies may often be effected, and at the same time influences which distrub trade conditions can be eliminated.

(7) Excess plant capacity and high fixed charges greatly encourage price cutting and tend to produce a chaotic and disorganized condition in the market. Again the solution must be in co-operative action and the adoption of standardized trade practices.

In short an industry is well situated from a marketing standpoint when its members understand economic laws and are able to co-operate effectively for the prevention of unfair competitive practices; and when individual concerns in the industry base their policies upon thorough analysis of costs and keep their costs at a minimum, at the same time rendering first-class technical and supply service to buyers. A well organized industry whose members are competent to manage their respective operations has a far better chance of surviving than one which is throughly disorganized and whose members are unintelligent, uninformed or incompetent. Circumstances of course occasionally arise which are beyond control. Yet there is no question but that the troubles which some raw materials industries have experienced since 1920 are in part the fault of the industries themselves.

Ruhr Nitrogen Capacity Estimated at 78,000 Tons

Nitrogen fixation production capacity in the Ruhr, consisting of factories actually established there for the utilization of coke-oven gases in the synthesis of ammonia, is estimated at 78,000 tons by the "Frankfurter Zeitung." More than half of the above figure (40,000 tons) is the output of the two factories of Sodingen and Hibernia, each with a capacity of 20,000 tons and using the Mont Cenis process. The third plant of comparable output will be that near the Scholven Mines of the Hibernia Concession. The Ruhr-Chemie group, which combine owns most of the coke-ovens in the Ruhr, exploits the Casale process. Its ammonia factory at Holten will soon be started with the initial capacity of 20,000 tons of nitrogen, which will shortly be doubled. As the third group there is the Klockner Potash Group (Wintershall), which has a factory near the Victor Mines at Rauxel, where the Claude process is used, and which is capable of fixing 18,000 tons of nitrogen. Finally, it is understood that negotiations are proceeding between the Nitrogen Engineering Corp. of America and the Ewald group. This latter, although affiliated to the Ruhr Chemie has not joined with it in the manufacture of synthetic ammonia. The capital invested in the Ruhr for the fixation of nitrogen, during the last two years, amounts to 85 million marks. The interests concerned are optimistic that, at present prices for nitrogen, the profits obtained will enable them very shortly to write off their capital cost.

Societe Belge de L'Azote intends to undertake the production of calcium cyanamide, with an annual output of 21,000 tons. Belgium is a great consumer of this substance, the amount used being 24½ kilos per hectare of cultivated land, against 20 and 8 kilos, in Germany and France respectively. At present it is imported, mainly from Germany, with a smaller quantity from Norway. The high lime-content plays an important part in the treatment of the acid soil of Belgium. The growth of the Belgian use of calcium cyanamide is indicated by the fact that imports of 5,000 tons in 1919 grew to 35,000 tons in 1927-28.

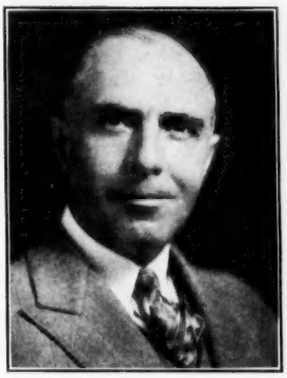
Amalgamated Chemical & Fertilizer Co. is formed in Saskatoon, Canada, according to the Department of Commerce. It intends to establish a factory at a cost of about $150,000 for the manufacture of chemical fertilizers, sulphuric acid, weed killer, and other heavy chemicals. A plant has been purchased and negotiations are now being conducted with American manufacturers of fertilizer machinery. It is understood that the company will specialize in the manufacture of superphosphate fertilizer, obtaining phosphate rock from Alberta and Montana and making sulphuric acid from ore obtained in the Flin Flon district.

Concurrent TARIFF REVISION

By Harry L. Derby

Vice-President, Kalbfleisch Corp.

THERE are some 6,000 items in the tariff. Prior to the creation of the Tariff Commission, any change in any of these items was possible only through an act of congress. With the creation of the Tariff Commission, it became possible for the President to raise or lower the duty on any particular article to the extent of 50 per cent., provided, after investigation by the Tariff Commission, the cost of producing the article in question in the foreign country justified the proposed change. The element of foreign cost was the only factor that, under the Tariff Act, the President could take into account. It was found that in many of the investigations conducted by the Tariff Commission that the cost of producing an article abroad does not always correctly measure its competitive advantage or disadvantage in the place of market. It was also found to be extremely difficult and in some cases impossible, to determine the foreign cost—either the foreign producer declined to give this information, or the methods of bookkeeping were such as to make an accurate comparison with domestic costs impossible. Foreign countries resented the efforts of the Tariff Commission to compel them to furnish cost information, and the activities of the Tariff Commission were accordingly greatly hampered.



No provision was made in the Act of 1922 for taking any article from the Free List and placing it on the Dutiable List, nor was it possible to remove from the Dutiable List to the Free List—the result being that no item on the Free List, by reason of conditions existing when the tariff became a law, could be removed therefrom, even though conditions subsequently resulted which made that article a serious menace in competition with the domestic article.

Unfortunately, Congress cannot consider any one item without opening the whole tariff schedule for re-adjustment. Constantly changing conditions make necessary tariff adjustments, with the result that with each new administration there is an attempt at general tariff revision, at least once in four years. This has the result of unsettling business and causing great expense for tariff investigations and hearings, and a tremendous amount of work on the part of the Congressional and Senatorial committees charged with this tariff responsibility.

Even if a tariff could be made perfect and equitable in every particular, within the first six months' period after the passage of the act there would be items on the tariff bill which would be out of line with the then existing conditions. This situation is a serious handicap to American business.

The remedy for these conditions is found through a change in the so-called 'flexible section' of the Act. As heretofore stated, the basis on which the Tariff Commission may recommend a change is only the comparison of foreign and domestic costs. This having been shown inadequate, we then seek the underlying motive for change in ratings, and we find that the necessity for such changes occurs through all the factors of competition—not only the cost of production, but of equal importance is the wholesale selling price of foreign and domestic articles in the principal markets of the United States, also the difference between the wholesale selling price of the domestic article in the principal markets of the United States, and of a like or similar competitive article in the principal markets of the competing countries—the invoice price of foreign competitive articles imported into the United States—the advantages granted to a foreign producer by a foreign government, or by a person, partnership, corporation or association (cartel) in a foreign country—the cost of transportation from the foreign country to the domestic market—granting of bounty to the foreign producer.

If the President were empowered to take into account all these elements, always under the direction of Congress as to the policy of Congress, and with the advice and recommendation of the Tariff Commission, then the tariff truly would be flexible and could meet the changing conditions in American industry without the necessity of a general revision of the tariff each time that a new condition arises. The Congress is responsible to the people for tariff policy and would lay down principles for the President and the Tariff Commission to follow, and thereby refrain from the delegation of legislative authority to the executive. If the policy of the Congress were for a protective tariff then, accordingly, the changes made by the President must necessarily conform thereto. If, on the other hand, the Congress determined upon a policy of tariff for revenue only, the President would of necessity be guided accordingly.

How Improved Production Methods Brought

Lower Aniline Oil Prices

By P. H. Groggins
U. S. Department of Agriculture

IN SPITE of the ever changing complex of the chemical industry the demand for aniline oil during the past decade has steadily continued. The logical trend to the faster anthraquinoid vat dyestuffs and the revolutionary changes in rubber accelerator compounds have not materially altered the market position of this intermediate. Reasons for the ever increasing consumption are not difficult to find, as the market for aniline is wide and is affected by a number of diversified influences. It is important to remember, however, that only a small proportion of the total dyes produced are actually derived from aniline, in spite of a popular misconception based on the historical development of the dye industry.

The prominent position held by aniline in the list of manufactured intermediates must be attributed, therefore, to various inherent physical and chemical characteristics. The most obvious of these may be listed as follows: Ease of handling; high degree of purity; stability; noncorrosive character; Susceptibility to further chemical transformation for (a) Substituted amines—Sulphanilic acid, p-nitroaniline, aniline salts, etc., (b) Secondary amines—Diphenylamine, ethyl aniline, etc., (c) Tertiary amines—Dimethylaniline, etc., (d) Anilides—Acetanilide formanilide, etc., (e) Azo dyes—When diazotized and coupled. (f) Substituted guanidines—di and triphenyl guanidines. (g) Phenlglycine for indigo manufacture. A final and highly important attribute of aniline is its cheapness.

Aniline Oil Production

Year		Pounds
1918	-	24,102,129
1919	-	24,345,786
1920	-	39,234,186
1921	-	5,639,234
1922	-	21,401,864
1923	-	26,671,961
1924	-	22,257,354
1925	-	24,989,301
1926	-	26,028,939
1927	-	27,084,227

It is easily perceived that aniline finds its way into a multitude of channels for the preparation of the above-enumerated compounds. It is difficult, however, correctly to indicate the distribution of the intermediate among the consuming industries on account of the overlapping that is incidental to the preparation of the final intermediates. Roughly, however, the following division may be made of the approximately 26,000,000 pounds annually produced:—Dyes and dye intermediates, 45 per cent.; textile trade, 12 per cent.; rubber industry, 30 per cent.; paint manufacture, 8 per cent.; other purposes, 5 per cent.

Among the more important intermediates derived from aniline are acetanilid, diethylaniline, dimethylaniline, p-nitroaniline, diphenylamine, sulphanilic acid, and phenylglycine, the last named being an intermediate product in the preparation of indigo. Aniline is also used to a large extent in the preparation of azo dyes, being first diozotized, and then coupled with a host of other compounds. Aniline salt for the preparation of aniline black is the chief item of distribution to the textile trade. The rubber industry demands an increasing variety of new intermediates for accelerator purposes. Some of the older aniline derivatives used by the rubber industry are aniline sulfate, thiocarbanilide, dimethylaniline, diphenylguanidine, triphenylguanidine, and formanilide. Included in the newer derivatives are ethylidine-aniline, heptylidine-aniline, and crotilidine-aniline. The paint industry utilizes a number of intermediates, principally as dry colors, p-nitroaniline-red being a typical example. Probably the most interesting general application for an aniline derivative is the use of diphenylamine as a stabilizer in the manufacture of explosives.

A matter of great interest is the marked advances made in the technology of aniline production during the past decade. These improvements relate to the chemical factors as well as to the chemical engineering functions involved in the unit process. It is gratifying that most of the patents in this field are of American origin as this augurs well for the future of the domestic dye industry.

The outstanding achievement has undoubtedly been the perfection of the process for making aniline from chlorobenzene. This involved a comprehensive study of the chemistry of the reaction as well as the introduction of novel engineering ideas. The ammonolysis of the halide takes place in the presence of cuprous salts preferably in copper autoclaves, although

the use of the latter is not essential. The process is particularly adapted for economical production of the amine in plants where chlorine is manufactured and utilized on a large scale. Under such circumstances chlorine or chlorobenzene may be introduced at a low figure. The injection of this new completion has had a far-reaching effect which has been reflected in the lowering of the market price of this commodity, but of even greater importance to the consumer of aniline is the fact that this enterprise was definitely instrumental in accelerating the thorough examination of the older processes which was already under way. Evidence of this activity in revamping the iron-acid process is manifested not only in the new patents which have come to light, but also in the newer types of apparatus that have been portrayed in the chemical engineering journals.

Contributions of the Chemist

The iron reduction of nitrobenzene to aniline has been known and practiced for almost three quarters of a century, but it is apropos to note some of the improvements in this process. Notable among the chemical achievements has been the substitution of neutral catalysts for hydrochloric acid. The utilization of a finely divided iron and higher pressures has helped to hasten the reaction and to lower the quantity of catalyst necessary for reduction. The introduction of neutral salts is a matter of great importance, not so much on account of the saving involved but chiefly because it has made possible the removal of acid tubs, tanks, and lines and contributed greatly toward improved operating conditions.

In 1916 Bucherer showed that ferrous chloride and not hydrochloric acid was the true catalyst in the iron reduction. Shortly after, investigations showed that other soluble chlorides could be used, Lyons and Smith of the University of Indiana in a brilliant series of researches with ordinary table salt (NaCl,) or ferric chloride obtained theoretical yields upon reduction. In 1925 Clark Davis of the duPont Company showed that nitre cake could be substituted for part of the sodium chloride, (U. S. Patent 1,663,476). The free acid of the nitre cake acting on the chloride to produce hydrochloric acid introduces an economical means of effecting the reduction. The I. G. Farbenindustrie in a communication to Carpmael showed that the utilization of a larger quantity of acid or salt, corresponding to a concentration greater than six per cent. hydrochloric acid, will yield a more finely divided iron oxide sludge, which is suitable for pigments (British Patent 279,283-1927). Although in this procedure the cost for material appears to be greater, the increased expense may be more than justified by the returns from the by-product. Furthermore, it is altogether feasible to return to the reducer the aqueous layer containing the dissolved catalyst. A patent (U. S. Patent 1,662,421) to the Grasselli Dyestuff Corporation uses small quantities of ammonium and iron sulfides under pressure in an atmosphere of hydrogen or carbon monoxide. Other patents have shown the practicability of using only small amounts of sodium sulfide under pressure to carry on the alkaline reduction of nitrobenzene.

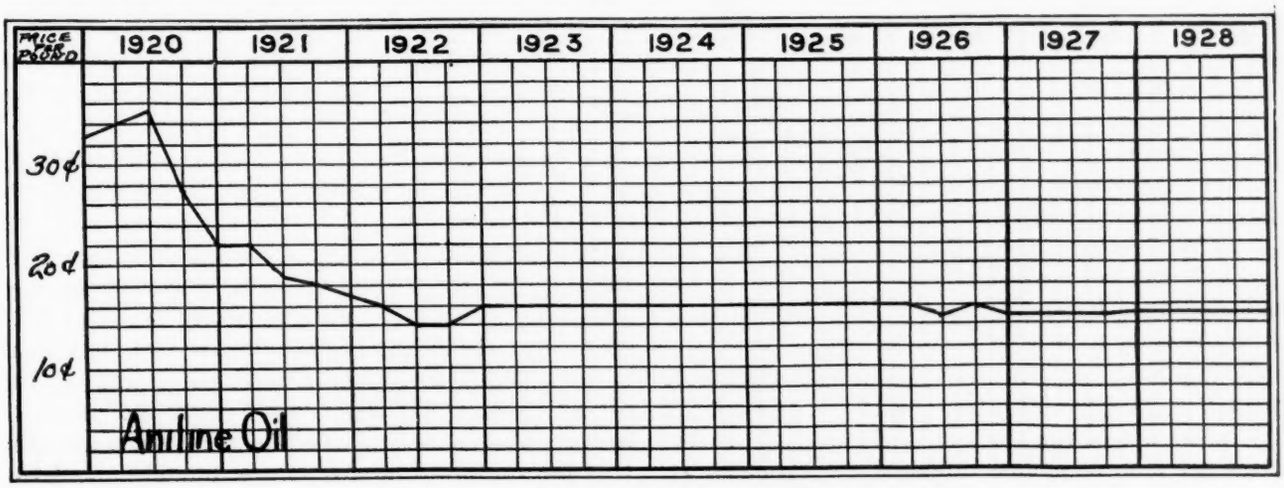
Contributions of the Chemical Engineer

The chemical engineering achievements have been twofold: First, perfecting the reduction apparatus; second, simplifying and making more efficient the separation of the aniline from the reducer charge. The following changes in equipment were made:

1. Acid resistant liners for the reducers were introduced. These were at first made of cast iron and later were reinforced or substituted by a lining of acid proof masonry. This step greatly prolonged the life of the basic equipment.

2. The agitators were redesigned, making possible the replacement of plows or rabbles without thoroughly overhawling the machine.

3. Ordinary reducers were supplanted by jacketed equipment in order to materially decrease operating costs and accelerate the reaction by limiting the amount of water entering the reducers.



This price curve shows graphically how competition in the aniline oil market resulted in improved production technique which in turn brought about low stabilized prices.

4. The introduction of the adjustable stirrer made practicable the settling of charges in the syphon system of oil separation.

5. With a better understanding of the dynamics of the reaction arrived at through a study of the iron oxidation, improvements in agitator design were effected. This made possible the use of very finely divided iron, and the reaction was made to take place in a shorter time, under conditions which permitted mechanical or automatic feeding.

The foregoing improvements were accompanied by changes in the technic of separating the aniline from the reducer charge. Some time ago in "Aniline and Its Derivatives" the writer pointed out some of the factors making for economical production. These are as follows: (a) Determination of the best method of manufacture, (b) selection of the best type of equipment, (c) high operating efficiencies, (d) large productivity from equipment used, (e) interdepartmental transfer or purchase of materials at low prices, (f) low overhead and fixed charges.

The present article touches briefly only on the first of these factors, determination of the best method of manufacture. It is unquestionably true that the choice and maintenance of the most efficient method of operation is of the utmost importance. In order more clearly to visualize and appreciate the changes that have taken place in the nitrobenzene reduction process, the following approximate data relating to the cost of the several known procedures are set down:

Type of separation	*Cost per 1000 lbs. Dollars*
1. Steam distillation of aniline, nonjacketed reducer	12.81
2. Steam distillation of aniline, jacketed reducer	10.26
3. Steam distillation of aniline, nitrobenzene extraction of aniline—water, nonjacketed reducers	8.16
4. Steam distillation of aniline, nitrobenzene extraction of aniline-water, jacketed reducers	6.15
5. Use of aniline boiler to generate steam from aniline water	4.11
6. Reduction in jacketed reducer accompanied by vacuum still	3.11
7. Filtration of reducer charges	1.20
8. Syphon system, according to various modifications	1.00-4.25

Economic Considerations

It is difficult if not impossible accurately to appraise the comparative merits of the various methods of producing aniline. The actual costs are largely a matter of organization bookkeeping. Some important factors are apparent, however, and comparisons can be made. Thus, assuming that the neutral and alkaline reductions of nitrobenzene are equally efficient, it is a matter of interest to inquire how they compare with the ammonalysis method.

1. Chlorobenzene has been listed at a slightly higher price than nitrobenzene, but on account of its lower molecular weight the net cost of the benzene derivatives per mol. of aniline produced are about equal. (112.5 x 6.3 cts = $7.08 for chlorobenzene; 123 x 5.8 cts. = $7.13 for nitrobenzene).

2. The cost of catalysts, cuprous chloride for the amination and ferrous chloride (sodium chloride, nitre cake, iron sulfide) is also about the same. In fact, so little is used that differences would not be appreciable.

3. The cost of iron per mol. of aniline is somewhat less than the cost of ammonia required for ammonolysis. (Iron cost per mol. aniline = $1.10; ammonia cost per mol. aniline = $2.72). The NH_3 cost is arrived at by taking two molecules at eight cents per pound. (17 x 2 x 8 = $2.72). One of the two NH_3 groups entering into the reaction ($C_6H_5Cl + 2NH_3 = C_6H_5NH_2 + NH_4Cl$) is recoverable, but from experience it is known that the losses inherent in a process utilizing such an excess of ammonia are of considerable magnitude. The progress being made with the fixation of nitrogen applies equally to both processes. The reduced cost of ammonia is promptly reflected in a decreased cost of its oxidation product, nitric acid. Thus the cost of nitrobenzene keeps pace with the advances made in the production of synthetic ammonia.

4. It is difficult to compare operating efficiencies, since the reduction of nitrobenzene yields aniline alone, whereas in the ammonolysis of chlorobenzene, phenol and diphenylamine are also formed and recovered. It is not probable, however, considering the cost of isolating and purifying the several constituents, that the net value of the products obtained in the latter process are greater. Nor is it probable that the yields of aniline by reduction suffer in comparison when the reducer plant is efficiently operated.

5. Owing to the fact that only liquids are involved in the ammonolysis of chlorobenzene, the process is adaptable to continuous operation. It is more than probable, however, that the next decade may witness changes whereby the reduction of nitrobenzene will be effected in a similar manner.

6. With the introduction of novel metallurgical procedures for making iron from its halides rather than through the medium of blast furnaces, it is certain that the cost of the catalyst for reduction processes will be greatly decreased.

7. Finally, it appears that a market should be developed for the by-product iron oxide resulting from the reduction process. The patent previously mentioned for obtaining it in a finer state of sub-division should present no economic difficulties, particularly when the catalyst is cheap and recoverable.

In concluding, it appears that the American dye industry has contributed its share in developing the aniline oil technology to a high degree of perfection. As a result of these technical advances there has been a gradual and consistent lowering of prices of the secondary intermediates derived from the primary amine. The consumers in all fields may rest assured that the continued improvements brought about by a healthy competition will result in a continuation of the present low prices.

Once Chiefly Used
As a Refrigerant

CALCIUM CHLORIDE

Is Now Important
As a Road-Maker

By J. A. Panter
Dow Chemical Company

IT IS not difficult for anyone having knowledge of the calcium chloride business in the past ten years, either from the manufacture or sales standpoint, to recall the day when the only market of consequence for calcium chloride came from the refrigerating industry. Comparatively, a few years ago one spoke of the manufacture or sale of calcium chloride in relatively small figures, and the possibilities of increasing the demand by the sale of calcium to more diversified lines seemed very remote. However, in recent years, this condition has changed and this change is to be credited to the research departments of both consumer and manufacturer. Many and more important uses have developed and to-day calcium chloride becomes one of importance to the chemical industry from the standpoint of tons manufactured and actually consumed. While the actual consumption has increased, the manufacturer has kept abreast of the times, and, in fact, anticipated this demand to the extent that at no time has there been even the slightest suggestion of a lack of supply; for, in fact, production has increased in excess of the demands and should some new use develop over night, there is a flexible production available to take care of any emergency.

Ten years ago, so-called solid or fused calcium chloride 73-75 per cent. was considered standard, and the consumer found it necessary to undertake the breaking up of this solid mass at considerable loss and expense before using it. There was also the old style granular calcium. This product was most unsatisfactory to produce, and as a rule failed to remain in a granular condition for any length of time, usually reaching destination on shipment in a more or less caked condition, thereby defeating its purpose. This product was also 73-75 per cent. $CaCl_2$ and like the solid was not always free from impurities, which caused more or less trouble to the refrigeration engineer. The so-called solid calcium of improved quality is still with us, but the granular product has been replaced by calcium chloride 77-80 per cent. flake, and is manufactured by a more efficient process, which practically eliminates caking, assuring the customer of a free-flowing calcium that can be stored for an indefinite time, and the manufacturer of a product that can be produced in large quantities and successfully carried in storage in anticipation of heavy shipments when required.

At this time a radical change was made in the shipping container. Many objections had to be overcome when it was suggested that flake calcium chloride was to be shipped in canvas bags. One could hardly conceive of a product that would absorb three times its weight in moisture being shipped in any other than a metal container. These objections were finally successfully eliminated in the development of an efficient water-proof bag, and in this type package to-day the greater portion of flake calcium chloride tonnage now reaches the consumer.

Calcium chloride finds its chief use today in the building and maintaining of public highways. This picture shows how it is applied during the dusty season.

Refrigeration has already been mentioned as the backbone of the calcium chloride

industry. To-day this demand gives way as far as tonnage is concerned to the building and maintaining of public highways, and from this use the really big business has developed. Who ever heard of shipping a train load of calcium chloride for refrigeration purposes? While to-day in the heart of the busy season when the dust nuisance is pestering the tourist and the demand for dust-free roads is made to the highway engineer, carloads of calcium by the hundreds and even train loads of flake calcium are rushed to destination and distributed to numerous county and state departments where it is eventually spread over the highways and absorbs moisture to the extent that dust is eliminated wherever calcium is applied.

Calcium chloride has long been used to eliminate dust on gravel roads and highways, but only recently a calcium chloride mixture has been developed that is now being used in increasing quantities in the so-called dusting or treating of coal. This chemical mixture in liquid form is sprayed on the coal under pressure either at the mine or in the yard, and the ultimate consumer is assured on delivery of a dustless product, which remains dustless for a long period, as well as having other advantages over untreated coal, thus creating an additional use for calcium that was practically unknown a few years ago.

In fire protection, both the sprinkling systems and such other equipment as fire barrels, buckets, etc., that are necessarily exposed to the elements, and particularly when it is a problem of freezing, calcium chloride plays a most important part. The tonnage consumed for this purpose is large and its efficiency is recognized so that the demand is increasing from year to year.

One could go on indefinitely mentioning its uses in some way in practically all lines of industry, small in some cases but just as important to the user. From small beginnings, calcium chloride has become one of the principal heavy chemicals produced in large quantities.

World production of superphosphates during 1928 is estimated at 14,250,000 tons in 1928, according to "La Semana Financiera," Spain. Of this amount 61 per cent. was produced in Europe, 23 per cent. in America, 8 per cent. in Australia, 6 per cent. in Asia, and two per cent. in Africa. In the European production France ranked first with an estimated production of 2,000,000 tons, followed in order by Italy, with 1,500,000 tons, Spain with 1,000,000 tons, England and Germany with 800,000 each, and the Netherlands 600,000. Compared with production figures for 1913 the production of England and Germany decreased while that of Spain increased 95 per cent., the Netherlands by 75 per cent., and Italy by 63 per cent.

Ammonium sulfate exported from Germany during the first nine months of 1928 amounted to 596,972 tons (139,505 tons to France 127,893 to Japan, 112,372 to Holland, 52,957 to Belgium, 41,020 to Spain, 40,726 to Denmark and 23,305 to China). This represents an increase of 25 per cent. over the corresponding figures for 1927, 60 per cent. over 1925 and 950 per cent. over 1913.

Rayon producing companies in Italy, including the General Rayon Company, Ltd., sign an agreement regulating their sales prices and controlling production.

The Industry's Bookshelf

My Philosophy of Industry, by Henry Ford, 107 pages, Coward McCann, Inc., New York, $1.50 net.

An authorized interview with Fay Leone Faurote in which the progenitor of the famous Model T discusses the modern era. The discussion is divided into four headings under the titles of "My Philosophy of Industry," "Machinery, the New Messiah," "Success," and "Why I Believe in Progress."

The International Protection of Trade-Marks by the American Republics, by Stephen P. Ladas, 136 pages, Harvard University Press, Cambridge, Mass., $2.50 net.

A study of the problems of Inter-American trade-mark protection and repression of unfair competition brought about by with a projected plan for remedying trade-mark difficulties between the republics of the Americas.

The Growth of Manufacturers 1899 to 1923, by Edmund Ezra Day and Woodlief Thomas, 205 pages, Government Printing Office, Washington, D. C., $1.35 net.

One of the Census Monographs which correlates the material made available by the biennial census of manufactures published by the Department of Commerce.

The Pyrolysis of Carbon Compounds, by Charles DeWitt Hurd, 807 pages, The Chemical Catalog Co., New York, $12.50 net.

One of the American Chemical Society Monograph Series which has as its purpose the complete organization of all material relating to thermal decomposition in organic chemistry.

Assuring Operating Profits, by Allen W. Rucker and Laurance H. Sturtevant, 42 pages, University Press, Cambridge, Mass.

How modern engineering assures profit in advance of investment in equipment.

Kingsport, by Howard Long, 304 pages, The Sevier Press, Kingsport, Tenn.

The story of this Tennessee town, giving its history; the theories and principles upon which the city was built; and a brief sketch of each of its fifteen major industrial operations.

General Science, by Anna B. Regenstein and William Ray Teeters, 664 pages, Rand McNally Co. Chicago, Ill., $1.60 net.

A textbook which aims to prepare the student for useful citizenship by applying science to the home, the community and to business.

Labor and Automobiles, by Robert William Dunn, 224 pages, International Publishers Co., New York, $2.00 net.

A discussion of the relations between capital and labor as found in the automotive industry, "written from an avowedly labor point of view."

Chemical Publications, by Melvin G. Mellon, 253 pages, McGraw-Hill Book Co., Inc., New York.

Being a complete discussion of the nature and use of the vast quantities of chemical literature.

Tree Crops, by J. Russell Smith, 345 pages, Harcourt, Brace & Co., New York, $4.00 net.

A highly interesting account of tree farming with some points regarding domestic vegetable oil production, well worth noting.

John Wesley Among the Scientists, by Frank W. Collier, 350 pages, The Abdington Press, New York, $2.00 net.

In which it is shown that the founder of Methodism was well abreast of the science of his day.

The Farm As An Important CHEMICAL CONSUMER

By Charles H. MacDowell*
President, Armour Fertilizer Works

The rapidly mounting bulk of agricultural chemicals makes the entire subject of "farm relief" of paramount importance to the chemical manufacturer as well as to the farmer. The fertilizer business is tending to become almost wholly a heavy chemical business. In addition,

the farm consumes chemicals in insecticides, fungicides and even in stock feeds, so that the sum total is of considerable magnitude. Consequently, the prosperity of the farmer is of vital interest to the chemical industry for it "is reflected in the works and laboratory".

CHEMICALS used on the farm are quite varied in character and quite imposing in quantity. They represent a substantial share of the total chemical business of the country. The prosperity of the chemical manufacturer is directly and integrally bound up with the prosperity of the farmer. Let us examine what these chemicals are, and the economic situation in regard to them.

The fertilizer industry is essentially a heavy chemical industry. It is based on the manufacture of sulfuric acid and superphosphate, and nitrogen and potash compounds. Originally it was largely dependent on various organic by-products, but to-day these have become relatively less important. The industry has become more and more a consumer of manufactured and natural inorganic chemicals.

Last year this country used nearly eight million tons of commercial fertilizers, valued at $225,000,000. About four and a half million tons of this were superphosphates requiring some 2,600,000 tons of 50° Baume sulfuric acid and approximately the same amount of phosphate rock from Florida, Tennessee and Idaho. About 550,000 tons of sulfur were burned to produce the acid. The greater proportion of this sulfur was in the form of brimstone, although pyrites and smelter by-product sulfides were important. Sulfur is also added direct to the soil in certain areas, both in the native and in the inoculated form. Our by-product coke plants contributed over 600,000 tons of sulfate of ammonia to the fertilizer tonnage, using 600,000 tons of 60° sulfuric acid in its production. Over 650,000 tons of nitrate of soda were imported from Chile and 150,000 tons of synthetic nitrogen compounds from Europe; 800,000 tons of potash salts came from Germany and France, and 90,000 tons from California. Organic materials such as cottonseed meal, dried blood, tankage and processed industrial wastes were used. Except for the last, however, the better grades of these materials generally find their way into stock and poultry feeds, and merely the off grades are used in fertilizers. This year for the first time domestic fixed nitrogen compounds have been used extensively in the fertilizer industry. Cyanamid containing fixed nitrogen has been brought from Canada and Europe and used to the extent of 75,000 to 100,000 tons a year in the manufacture of fertilizers.

The farmer buys principally mixed fertilizers, and pays for them on the basis of their nitrogen, phosphorus and potassium content. However, the properly mixed and balanced fertilizer contains many other elements of vast importance on the farm. Many of these are inherently present due to the source of the raw materials—iron, calcium, magnesium and manganese from phosphate rock; sulfur from the acid used; magnesium in association with potash salts; iodine from Chile saltpeter. In certain sections of the country it has been found advisable, even, to add specific elements such as manganese or copper, which may not occur in sufficient quantities as impurities in the raw materials. In parts of the country, too, limestone, hydrated lime and gypsum are used in quantity as soil amendments. Paints and stains, with their consumption of oils,

**Abstracted from paper delivered April 30, at meeting of American Chemical Society, Columbus, Ohio.*

pigments and coal tar derivatives, are important outlets for chemicals on the farm.

In the realm of insecticides and sprays, sulfur again takes an important place, either as element sulfur or in the form of lime sulfur solution. Manufacturers of insecticides were the principal consumers of the 23,000 tons of arsenic available in the United States in 1928. This appeared on the farm chiefly in the form of metallic salts of arsenic acid such as lead arsenate and calcium arsenate. Hydrocyanic acid (much of it derived directly or indirectly from fixed air nitrogen) is used to great advantage in controlling certain pests, particularly in the citrus orchards. Salts of nicotine distilled from tobacco stems are used for sprays. Creosote oil and other coal tar fractions and petroleum distillates furnish animal dips and spray emulsions. Salts of mercury, copper, lead, barium, calcium, magnesium, zinc, sodium, iron, potassium and ammonium find their way to the farm as insecticides, disinfectants or weed eradicators. Formaldehyde is used in the treatment of seeds. The list is an impressive one and of real economic significance to the chemical industry.

But the use of these chemicals on the farm is of even greater economic importance to the country as a whole. The prevention of waste, spoilage and disease on the farm is as important as the plentiful production of stock and crop. In the near future the use of mechanical refrigeration will require appreciable amounts of chemical refrigerants for rural consumption.

Chemicals in Mineral Feeds

In the preparation of mineral feeds, the use of sulfur, carbon, salt, iodides, Glauber's salt, prepared phosphates, steamed bone meal and bone black are called for. They supplement the cereal diets of hogs and cattle and supply increased amounts of vital elements in which, especially the winter fodder, they may be somewhat deficient. This is an important and growing industry.

In the fertilizer industry the basic economic problem is to lay down on the farm, plant food at the lowest possible ultimate cost to the farmer. This by no means signifies the cheapest price per ton. That unfortunate fallacy in past years has occasioned many bad and uneconomic practices both on the farm and in the factory. Neither does it necessarily mean at the very lowest price per unit of plant food. What it does mean is at the greatest yield per acre from crops in dollars and cents to the farmer. To accomplish this requires intelligent research and painstaking effort not only by the industrial chemist but also by the agricultural chemist and agronomist, and the close co-operation of these workers in our science.

In earlier days raw materials for fertilizer manufacture were of relatively low plant food content. The phosphate rock only produced superphosphate of 13 per cent. grade; consequently many low analysis brands were offered for sale. As the concentration of materials increased these grades required the use of appreciable amounts of "filler" in mixtures. For this there is no economic justification, and the manufacturer is recognizing the fact and exerting an effort to educate the farmer to use higher analysis goods which require no filler. The result is a distinct tendency in the industry toward the production of higher analysis fertilizers which can be used more efficiently and economically on the farm. Such formulas are now being produced with present-day low-cost high-grade materials.

Concentrated Fertilizer Salts

The advent of cheap synthetic ammonia has stimulated chemists and engineers to develop processes for the production of highly concentrated and refined salts designed for fertilizer use. Their use introduces problems in agronomy which are being intensively studied, and problems in the distribution in the soil which may require a re-design of mechanical distributors. When these problems of production and utilization are answered these salts will probably be of much significance in fertilizer economy. Indeed, it is likely that they will in time displace some of the present lower analysis raw materials.

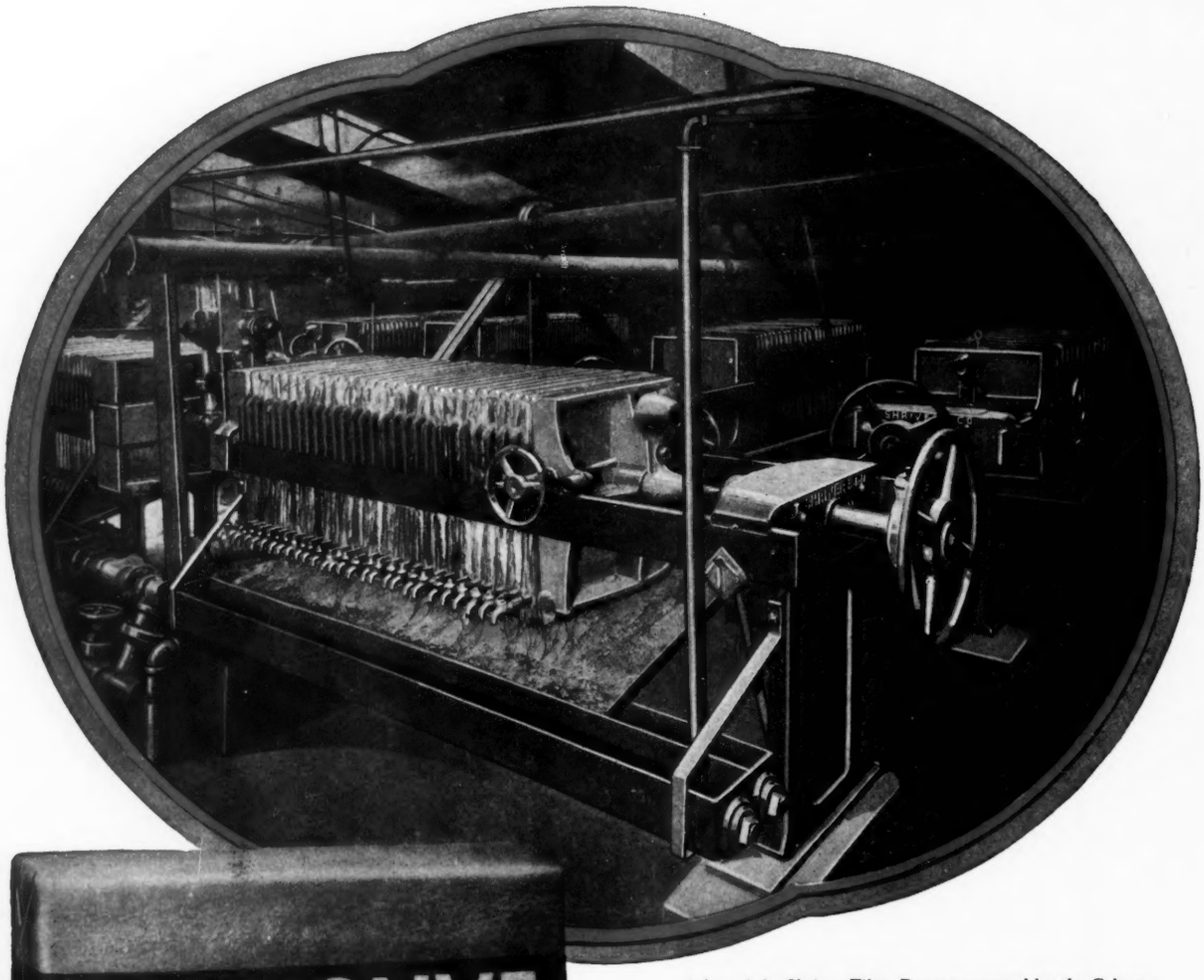
Chemical fertilizers will unquestionably be used in gradually increasing amounts. The growth in consumption is slow and steady. Economic agricultural conditions require greater yields per acre and the use of fewer acres in the regions now using fertilizer extensively. In the middle western corn and wheat belts soil depletion is slowly but surely becoming evident through poorer quality cereals and poorer yield per acre. Fertilizers will eventually be used in these regions in considerable amounts. The progress is slow. Much educational activity is necessary on the part of the experiment stations, colleges and manufacturers, but the time is coming.

The quantity and value of agricultural chemicals are of increasing significance to the chemical industry. They represent an important proportion of its output. The progress and prosperity of the farmer are directly reflected in the works and laboratory.

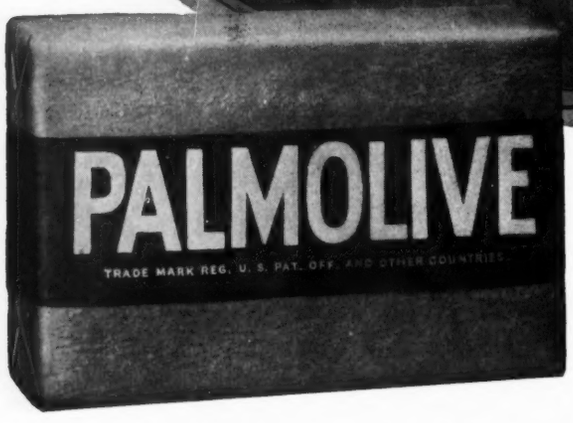
A low temperature carbonization plant, which is claimed to be the largest in the world, is now in course of erection at Glenboig, near Glasgow. It is being built by the Bussey Coal Distillation Co., Ltd., and is to operate on the "Bussey" principle. When working the plant will have a "throughput" capacity of between 500 and 600 tons of coal a day.

Leading German potash corporations are reporting large increases in profits. The Salzdetfurth corporation's net profit for 1928 was 3,800,000 marks, compared with 2,587,000 in 1927. Aschersleben earned 2,432,000, against 1,731,000, and Westeregeln 2,430,000, against 1,829,000.

Sulfur deposits estimated to contain 200,000,000 tons of sublimated sulfur of 99.99 per cent. purity, are reported to have been discovered near Calama, Antofagasta, Chile.



A few of the Shriver Filter Presses operated by the Colgate-Palmolive-Peet Company, manufacturers of Palmolive Soap



Palmolive Soap takes its place among the famous products that are produced with the aid of Shriver Filter Presses. The Colgate-Palmolive Peet Company, manufacturers of Palmolive Soap have for many years employed Shriver Filter Presses in their plants.

SHRIVER FILTER PRESSES AND PALMOLIVE SOAP

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How Much Are You PAYING FOR POWER?

By Frank W. Buck
The H. K. Ferguson Company

IN MANY manufacturing plants the power bill offers a wealth of opportunity to the executive who is looking for ways to reduce production costs.

It cannot be denied that many concerns that watch their general production expense with great care, still allow their power intallations to lag behind the standards that have been set for the rest of the plant.

To be sure changes in power installations are costly. Progress in the development of equipment is so rapid that it is difficult to keep abreast of it. But when an analysis by competent engineers reveals that substantial savings are possible, the necessary improvements usually are made without much delay.

For the executive of to-day is responsible to his stockholders for dividends, and is quick to avail himself of advantages that are possible through better methods and equipment. If he can be shown that an up-to-date installation can pay for itself within a reasonable time out of savings in operating cost, he usually is willing to make the change.

This is not always true. One of our engineers not long ago made a survey for a large manufacturer. His report showed that a new high pressure boiler installation with turbine generators costing $125,000 would return an annual saving of $72,000. But although extensive changes have since been made, the power plant improvement has been allowed to wait, despite the fact that two years' operation will pay for it.

Power Surveys Before Expansion

When a program of plant expansion is being considered, it is an opportune time to make a power survey. The possibility of a considerable increase in load, or changes in power requirements due to the introduction of new processes, makes it advisable to review the power situation carefully in order to obtain maximum economy.

Two years ago we were called upon to design and build an extension to the plant of a well-known manufacturer of metal furniture in western New York State. A small power plant was furnishing current for light and power. The question of additional power to operate the new departments had to be solved.

Naturally the owner thought of adding to his existing boiler plant and installing another generator. Our engineers made a study of his requirements and found that on the basis of the increased load he could obtain a new rate from the local power company that was lower than his own cost. Consequently the private plant was promptly shut down and current was purchased from the power company. The annual saving has amounted to approximately $4,500.

Make or Buy Power?

At about this same time our engineers were building an addition to a paper mill in central Ohio. When the original unit of the mill was built a power plant was installed. Later the company's output had been doubled by the addition of a new paper machine. This had increased the power demand far beyond the capacity of the plant, and additional power had to be purchased. Our study showed that because of the large quantity of process steam and water required, it would be good economy to provide a new power plant large enough to handle the company's full requirements. As a temporary measure it was recommended that the owner negotiate with the local power company for a lower rate based on the total load. The rate obtained was so advantageous that the new power plant has not yet been built, although still further economy is possible thereby.

Early in 1921 a large manufacturer of strawboard decided to establish a plant on property along the Mississippi River about twelve miles north of Keokuk Dam. The site was selected because of its location near a source of inexpensive power.

The owner's production plans for the new plant called for the use of large quantities of warm water in connection with the process. Accordingly a complete study of requirements for power and process water and steam was made. Our engineers recom-

mended the installation of high pressure boilers to operate a turbine of sufficient size to furnish power for the plant, using part of the exhaust steam to heat the water.

The plant was built as recommended with the result that power is furnished to the plant at a fraction of the cost of power from the plant at Keokuk. The original plant has since been doubled in size.

Providing for Expansion

Future expansion must be considered in the design of a power installation so that expense for alterations and rearrangement may be avoided.

At the present time our engineers are designing a power plant for a large chemical manufacturer, as a part of a large program of expansion. The power plant survey included not only a complete study of existing processes, but also a chart of future growth. The power plant is being planned so that standard units of 7500 kw. capacity can be installed as needed to take care of the growth of the plant to the ultimate capacity of the available land. New units can be added without interruption to production, and with no danger of disturbing the balance of the plant as a whole.

Proper utilization of waste material as fuel may be the means of substantial reduction in the cost of power. We encountered an interesting case of this sort in 1922, when we were called upon to make a power survey for a large manufacturer of wooden wheels for motor cars.

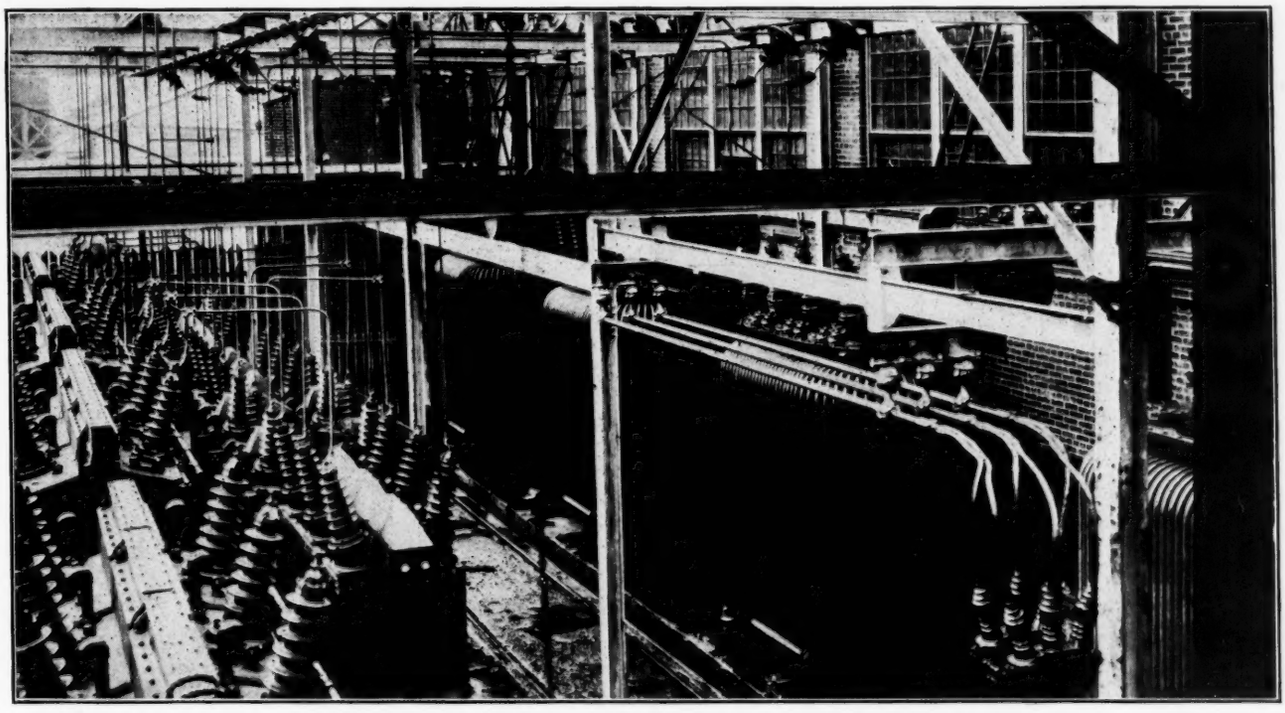
A battery of spoke lathes, stickers and polishers produced a large quantity of shavings and dust. Disposal of this waste was necessary from the standpoint of fire protection. By designing a special installation for burning it in suspension, either alone or in combination with semi-pulverized coal, power is delivered to the switchboard at a cost of eight mills ($.008) per kw. hour. According to the audit of a concern employed by the owner, the savings offset the entire cost of the installation including boilers, machinery and buildings, plus interest and depreciation, in the short period of thirteen months.

So many factors enter into the solution of the problem of economical power supply that it can safely be said that there are as many answers to the problem as there are plants. Central station practice has advanced to such a degree in recent years that many private plants have been rendered obsolete. A large chemical concern for which we are building a complete new plant in western New York State, is to have a low pressure steam plant for heating and process steam only. Power from Niagara Falls is cheaper than the lowest estimate for a privately operated plant.

Individual Problems Involved

On the other hand our engineers are designing a 52,500 kw. power plant for a manufacturer of electrical equipment. This plant, which will be located on tidewater, will generate steam at high pressure for a battery of turbine generators. Because low pressure steam will be used in large quantities for processes and for heating, power can be produced at considerably less than the cost of power from a large central station nearby.

Not only must the choice of power plant equipment be correct, but circuits must be designed to



In cutting power costs, a well designed power layout is an important factor in securing real economies. This view shows the outdoor switching station at the South Charleston, W. Va., plant of Westvaco Chlorine Products.

Hy-Speed Mixers

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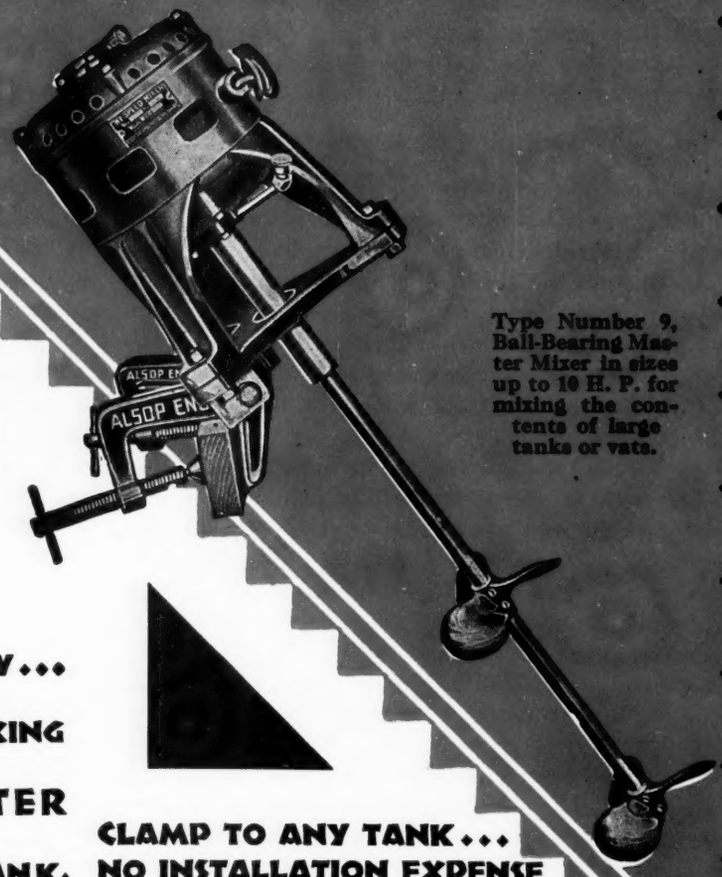
...BECAUSE ALSOP MANUFACTURES A COMPLETE LINE OF MIXERS WITH THE CORRECT POWER...SPEED...CAPACITY... AND RUGGEDNESS FOR MIXING ANY LIQUID BETTER IN ANY TANK.



Type Number 9, Ball-Bearing Master Mixer in sizes up to 10 H. P. for mixing the contents of large tanks or vats.

Showing a *"Hy-Speed"* Mixer mounted on an ALSOP 50-gallon Glass-Lined Tank Complete units, of from 5 to 150 gallons, can be furnished with mixer permanently mounted to the tank.

CLAMP TO ANY TANK... NO INSTALLATION EXPENSE

The proper *'Hy Speed'* model clamped directly to the tank, will mix the liquid contents of any tank or vat up to 50,000 gallons capacity quickly and thoroughly without attention.

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Makers of "Hy-Speed" Portable Elec-tric Mixers, Filters, Bottle Fillers, Pumps and Glass-lined Storage Tanks

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furnish the necessary flexibility to take care of varying load requirements. Our engineers recently designed and built a large sub-station equipped with four rotary converter sets. An engineer of another concern recommended that a single transformer be provided for each pair of rotary converters. This hook-up would have precluded any control of the division of the load on the individual converters, although it would have been correct for M. G. sets. Consequently individual transformers were installed for each converter.

A complete analysis of power equipment will determine the right motor to use for each purpose. It will also provide for power leads of sufficient size to prevent excessive line drop, a frequent cause of serious waste. The plant heating system will be carefully studied to determine the amount and type of equipment needed to heat the factory at minimum cost.

In short, such an analysis by engineers of proved ability who have no axe to grind, places in the hands of the executive an impartial report of his particular problem, that is the only safe basis on which to proceed.

Possibly because a power installation is a job for specialists, we are inclined to use it as we use our bodies. We drive them, over-load them and feed them improperly until they break down. And then we are willing to go to any expense to get them working again.

In China the people pay the doctors to keep them well. In this country insurance companies arrange for annual examinations for their policy-holders. Possibly the day will come when by some such means the specialist will be retained to combat obsolescence in the power plant and keep it in efficient running order.

A. O. Smith Corp., Milwaukee, publishes new bulletin entitled "Smithwelded Pressure Vessels", giving complete description of its products.

Marsh Stencil Machine Co., Belleville, Ill., publishes new booklet entitled "The Art of Marking Shipments", copies of which will be furnished upon request to the company.

Driver-Harris Co., Harrison, N. J., issues new reprint on "Nichrome" sheet carburizing boxes.

Raymond Bros. Impact Pulverizer Co., Chicago, issues special bulletin on its No. 0000 automatic pulverizer.

Link-Belt Co., Philadelphia, issues new catalogue listing sprockets carried at that plant.

American La France & Foamite Corp., Elmira, publishes new booklet entitled, "Killing Electrical Fires."

Alsop Engineering Co., New York, publishes new complete catalogue of portable electric mixers and glass lined mixing tanks.

Surface Combustion Co., Toledo, issues special bulletin on the performance of an "S. C." car bottom annealing furnace.

Pressed Steel Tank Co., Milwaukee, purchases assets of Seamless Steel Products Corp., also of that city.

New Plant Construction

American Cyanamid Co. purchases 250-acre tract near Tampa, Fla., as site for new plant for manufacture of phosphoric acid. Project will consist of several units with ultimate cost placed at about $3,000,000 including machinery. The company is developing new pebble phosphate deposits at Sidney, about 20 miles from Tampa, and will utilize output at new plant. About $350,000 from Tampa, and will utilize output at new plant. About $350,000 will be expended on the Sidney development.

International Gas Products, Inc., capitalized at $1,000,000, is constructing two carbon black units and one gasoline extraction plant at Monroe, La. Operations will start in September with expected daily output of about 25,000 pounds of carbon black.

Ducktown Chemical & Iron Co., Ducktown, Tenn., begins construction of acid plant addition to Isabella plant about two miles from Ducktown. Other expansion is also planned and entire project is reported to involve expenditure of $1,000,000.

Westvaco Chemical Products Co. plans erection of new plant unit at South Charleston, W. Va. New unit will comprise a group of buildings reported to cost more than $900,000 with equipment.

Celanese Corp. plans erection of $300,000 research laboratory unit adjoining plant at Cumberland, Md. This is part of a $5,000,000 program for plant expansion during 1929.

Texas Chemical Co., Houston, plans construction of new plant at Fort Worth, consisting of one-story units, reported to cost in excess of $50,000, including equipment.

Plough Chemical Co., Memphis, plans construction of five-story addition to plant to cost over $750,000 including equipment.

Proctor & Gamble Co. announces plans to build $500,000 addition to Hamilton plant for manufacture of oxygen and hydrogen.

Air Reduction Co. purchases site at Toledo upon which to construct an oxygen plant.

Bemis Bros. Bag Co. is constructing cotton mills and bag plant at Talladega, Ala., which will be in operation by August.

Niacet Chemical Co., Niagara Falls, will construct new one-story plant addition to cost about $28,000 with equipment.

Rio Tinto Co. and the Silica Gel Corp. have agreed to co-operate in the creation of an organization which will acquire and develop the interests of the Silica Gel Corp. throughout the whole world, with the exception of the North American Continent. The Silica Gel Holding S. A. was registered in Geneva in February of this year for this purpose, and Sir Auckland Geddes has been appointed its president. It is now engaged in the re-organization of existing representations in France and Germany into national subsidiary companies. Members of the Rio Tinto board and officials of the company have been appointed to the board of directors of the Swiss holding company and of Silica Gel., Ltd., hitherto the English subsidiary of the Silica Gel Corp. Proposals with regard to the formation of subsidiary companies in Japan and in British India are also under consideration.

Ralph Kilmer, vice-president in charge of sales, Pfaudler Co., Rochester, N. Y., dies suddenly, April 5, aged 40.

Brown Instrument Co. announces removal of Pittsburgh offices to larger quarters at 1522 Oliver Building, that city.

Japan Plans Increased Production of Acetic and Ammonium Sulfate

Synthetic acetic acid production in Japan has been given added impetus by the fact that the Japan Synthetic Chemical Laboratory, Ogaki, has secured the support of the Mitsui interests and increased its capitalization to yen 1,000,000. This gives the Mitsui interests of all acetic acid produced in Japan. Heretofore, only 10 tons of synthetic acetic per month has been produced by the Japan Synthetic Chemical Laboratory, but plant additions and new equipment are counted upon to greatly increase the output and perhaps eventually to free Japan from imported material. The carbide process is used by this company.

Japan consumes annually about 450,000 tons of ammonium sulfate, of which amount, about 250,000 tons are imported from Germany, America and England. Japanese production is divided about as follows: Electro-Chemical Industry, 80,000 tons; Japan Nitrogen Fertilizer, 60,000 tons; and Japan Artificial Fertilizer, the Mitsui Mining and other companies, 60,000 tons. The Mitsui interests, with the Electro-Chemical Industry Co., are said to be planning the formation of a new company, which will establish plants and have capacity of 60,000 tons in 1933, which will be increased to 285,000 tons by 1935.

Societe de Produits Chimiques Anzin-Kuhlmann has produced since its first factory was started up in December, 1926, 4,000 tons of ammonia, corresponding to 18,500 tons of ammonium sulphate. A second unit was set into operation last year and further extensions of the plant are at present in hand. According to information given at the general meeting of the Mines de la Loire, this company furnishes coke oven gas to the synthetic ammonia plant of Roche la Moliere, which also manufactures concentrated synthetic nitric acid in collaboration with the Saint Gobain Company.

Reports of the recent discovery of a 200,000,000 ten sulfur deposit in Chile are exaggerated and commercial interests there doubt whether a scientific survey has been made, reports the Department of Commerce. The deposit in question is at an altitude approximately 5,600 meters, in which exploitation is difficult since there is no existing transportation and only Bolivian Indians could withstand the hardships of the work.

Union Chimique Belge reports that after writing off over 10 million francs for depreciation, the net profits for 1928 had risen to 58 million francs. The sum of 19½ million francs has been allocated to the extraordinary reserve and to the financial reserve.

Mellon Institute of Industrial Research, Pittsburgh, publishes Second Annual Supplement to Bibliographic Bulletin No. 2, containing list of books, bulletins, patents, etc., by members of the insititute during 1928. Copies will be furnished upon request to the institute.

American Bleached Shellac Manufacturers' Association, New York, is carrying on an educational campaign to insure the consumer against any product which does not measure up to specifications for pure shellac adopted by the association.

Monsanto Chemical Works publishes an attractive, well-illustrated booklet of twenty-three pages, describing Monsanto, Ill., and its advantages as an industrial center.

Levis-Robinson Co., naval stores, is formed in New York by merger of firms of Irving A. Levis and U. M. Robinson. Company will act as agents for Taylor-Lowenstein Co., and Mobile Rosin Oil Co.

Charles Hardy, Inc., New York, announces removal of offices to 122 East 42nd st., that city.

Germany Begins Production of Synthetic Gasoline From Black Coal

Germany's first plant hydrogenating black coal for a yield of synthetic gasoline starts operations this month, according to the Department of Commerce.

The Leunawerke, of the German dye trust, is already producing around 50,000 tons synthetic gasoline annually from lignite, or brown coal.

The black coal hydrogenation unit is located at Duisburg/Meiderich on property belonging to Gesellschaft fuer Teerverwertung. The operating company is known as A. G. fuer Kohlenverfluessigung & Kohleveredlung (Company for Coal Liquefaction and Coal Refining) investors in it besides the Teerverwertung company, being the Hibernia, Harpen and Koenig Ludwig coal pits, as well as the Ruetgers-werke Aktiengesellschaft, of Berlin.

The coal hydrogenation company was founded in April 1927, and construction has been in progress on operating units ever since. Storage tanks of 5,000 and 10,000 cubic meters capacity are already up. When in operation, the plant will employ 150 workmen.

The plant will work the Berguis patents, having acquired these for black coal, along with the former Berguis experimental laboratories at Manuheim/Rheinau. Its recovery of oil from coal by hydrogenation is given at 45 to 55 per cent., against 1½ per cent. from coal yielding three per cent. tar

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Canadian Chemical Production Sets Highest Value in Ten Years

Value of chemicals and allied products produced in Canada during 1928, was the highest recorded since 1918, amounting to $142,994,889, a gain of $15,510,217 over 1927. Value of the raw material consumed was $72,115,140. Production of acids, alkalies, salts, and compressed gases industry, the most important group, amounted to $42,134,177. Paints, pigments and varnishes were of next importance at $27,601,138; medicinal and pharmaceutical preparations, $17,117,896, as against $16,249,191; miscellaneous chemical industry, $12,779,991 as against $11,900,521; coal tar products $4,114,920. Output of the fertilizer industry was slightly higher at $2,092,457; inks, dyes and colors, $3,321,475, and wood distillates, $1,647,137, all were slightly above the figure for the preceding year. The only group to show a lower out put value were the soaps, washing compounds and toilet preparations, at $18,649,842 as compared with $19,993,453 in 1927.

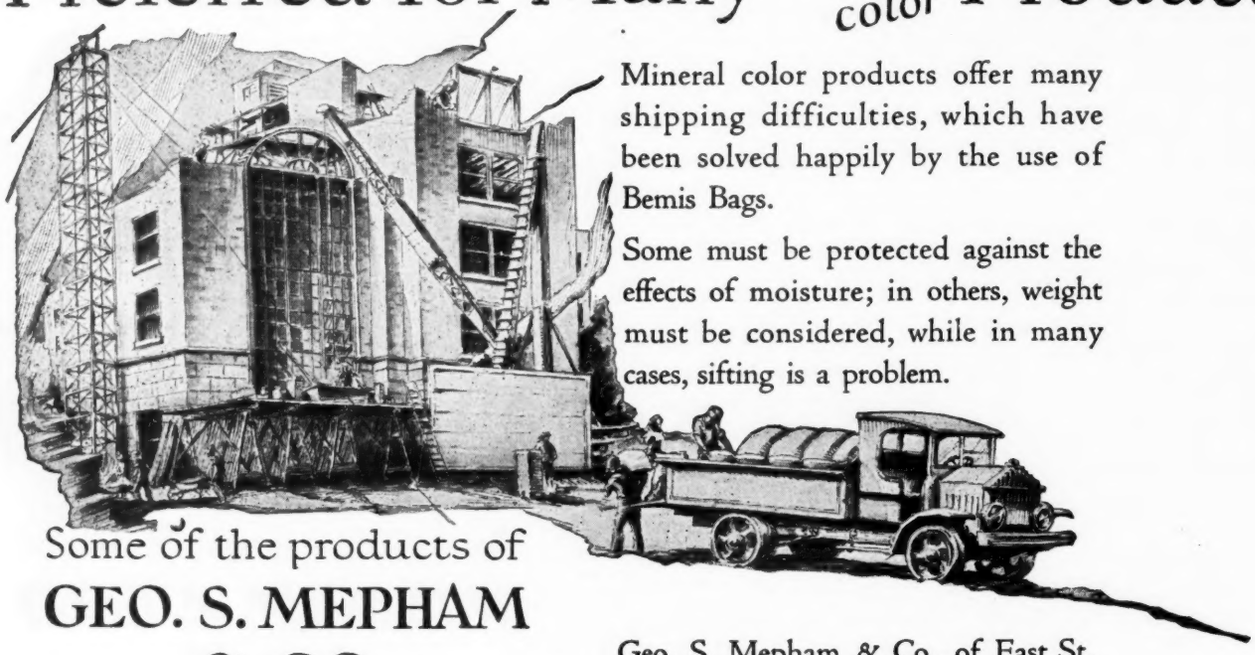
Distillerie Italiane is the only concern in Italy manufacturing acetone and butyl alcohol from the fermentation of cereals. The plant, located at Savona, began operations at the end of 1927, working as a licensee of an American company. The material used is rice hulls and, occasionally, corn. The plant has a capacity of 15 quintals of acetone and 30 quintals of butyl alcohol in 24 hours, and is at present working at full capacity. The butyl alcohol is used in another plant of the Distillerie in the preparation of butyl acetate, one of a series of solvents produced by the Distillerie Italiane.

I. G. Farbenindustrie absorbs most of the new issue of German stock in the German Ford Co., thus becoming an important factor in the Ford European plans. The 6,000,000 mark issue was to have been issued publicly in Germany at 109. This step practically assures the I. G. of an American market for its synthetic benzine and other products used in the motor industry.

The hexahyric alcohol *d*-sorbitol, corresponding to the sugar glucose, is being marketed by the I. G. Farbenindustrie A. G. as a sugar-substitute, under the name "Sionon." A favourable account of its action is given by A. Reinwein, University of Wurzburg, in the Deutsche *Medizinische Wochenschrift*.

SINCE 1858, THE WORLD'S LARGEST MAKERS OF QUALITY BAGS

Preferred for Many *paint and color* Products



Mineral color products offer many shipping difficulties, which have been solved happily by the use of Bemis Bags.

Some must be protected against the effects of moisture; in others, weight must be considered, while in many cases, sifting is a problem.

Some of the products of

GEO. S. MEPHAM & CO.

which are shipped in Bemis Bags

Asbestine	Metallic Red
Barium Sulphate	Mineral Black
Black Filler	Mineral Filler
Black Oxide	Mineral White
Brown Metallic	Mortar Colors
Brown Oxide	Ochre
Buff Oxide	Paris White
Calcium Carbonate	Persian Gulf Oxide
Carbon Black	Polishing Rouge
Cement Colors	Purple Oxide
Chalk	Putty Whiting
Chalk Whiting	Pure Iron Oxides
China Clay	Rouge
Chromium Oxide	Sienna, Raw & Burnt
Clays	Silica
Cliffstone Whiting	Slate Flour
Crocus	Sno-Float Whiting
Emery Wheel Clay	Soapstone
English Lump Chalk	Spanish Oxide
Freight Car Reds and Browns	Stucco Colors
Golden Ochre	Talc
Gray Ochre	Terra Alba
Green Oxide	Tripoli
Gypsum	Turkey Red
Indian Red	Tuscan Red
Kaolin	Umber, Raw & Burnt
Magnesium Silicate	Van Dyke Brown
Magnetic Black	Venetian Reds
Maroon Oxide	Washed Ochre
Metallic Brown	Whiting
	Yellow Oxide

Geo. S. Mepham & Co., of East St. Louis, Ill., manufacturers of fine pigments, avoid such difficulties by using Bemis Bags of cotton, burlap, paper, or of waterproof construction. They have been using Bemis Bags in steadily increasing quantities for over thirty years.

Can Bemis Bags (standard or made-to-order) do as much for you? To find out, ship us one unit in its usual container; we will ship it back to you in a Bemis Bag—or admit it can't be done!

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BROOKLYN
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Cotton Mills
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INDIANAPOLIS
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BEMISTON, ALA.

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COTTON ∽ BURLAP ∽ PAPER ∽ PRINTED OR PLAIN

Conveying Chemicals With PORTABLE LOADERS

By Martin H. Kidder
Link-Belt Company

ELEVATING and conveying machinery has proven its economy and efficiency in various industries, where volume has been sufficient to require its use. There are plants, however, which do not lend themselves to the use of complete elevating or conveying systems. Such plants have found that by using portable loaders in various places in their production system the cost of the portable unit was soon paid for out of savings in labor and increased production.

Portable loaders fall into five separate classifications; i. e., portable belt conveyors, portable bucket loaders, portable box car loaders, power propelled crawler loaders, and portable bag pilers.

The portable belt conveyor is used for handling dry and lumpy chemicals similar to sand and coal. It is also used for handling fertilizer materials such as bones and bagged materials, and in some cases for conveying the dry mix from one place to another in the plant. It has an adjustable discharge height; and the conveying belt is usually 18 inches wide, sometimes being fitted with cleats suitably spaced across its width, to keep larger pieces from rolling or sliding back. These conveyors usually have a conveying length of 21 to 31 feet.

One fertilizer manufacturer in Chicago uses three portable belt conveyors for different jobs around the plant. The machines are used in tandem in handling tankage to and from the storage piles to their conveyor system. This company has a complete elevating and conveying system but to increase the storage capacity of their space the portable loader is placed with its feed-end near the permanent conveyor system where a man shovels from the permanent conveyor on to the foot-end of the portable loader which discharges on to the foot end of another portable loader which in turn discharges on to the storage pile. As the storage pile is built up, the second portable conveyor is taken away and the pile is then built from one conveyor. In this manner, the permanent conveyors

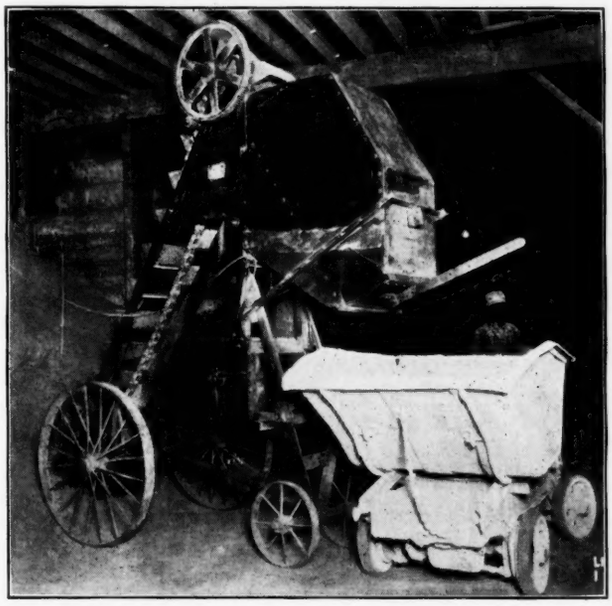
A portable belt conveyor handling oxide from ground to platform. This type conveyor has an 18 inch belt and a conveying length of from 21 to 31 feet.

need be spaced only 100 feet apart instead of within a "shovel throw" of about 10 ft. In this instance, labor saving is estimated at six man hours per conveyor hour, besides increasing capacity of the storage piles. This fertilizer plant is receiving a sizeable return on its investment as the maintenance cost is small and nothing has been spent for repairs.

A chemical plant in Chicago utilizes a portable belt conveyor mainly for handling coal which is unloaded from the car to storage by one man and a portable conveyor. It takes but three to four hours to unload a car in this way and eliminates four men as well as any dunnage charges accumulating through delays in unloading.

In a certain glue plant, a 21 ft. portable belt conveyor handles steam bone from storage piles to cars. A permanent conveying system carries the steam bone from the tanks to the outside storage piles from which it is loaded into the cars by the portable conveyor. Of course, in this plant they have complete elevating and conveying equipment but they have found the portable loader an indispensable medium in their production system.

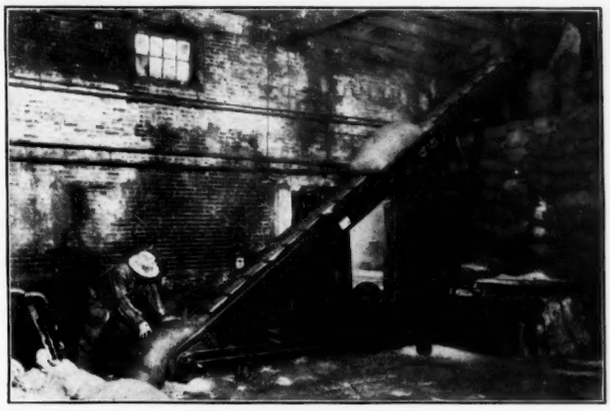
The portable bucket loader is made both mechanical- and hand-operated for transporting around the yard. We stress the hand-operated type of loader as it is the most commonly used. It was developed to satisfy the demand for a small hand propelled machine for use in certain sections of large plants, as well as in the smaller dry-mixing plants. A five horsepower motor



This shows a portable bucket loader delivering superphosphate into a power-operated buggy.

operates the elevator mechanism. An especially desirable feature is the arrangement and placing of the buckets to avoid any possibility of the material (particularly acid phosphate) accumulating in the chain links or being jammed against the backs of the buckets or the sprocket teeth. This machine saves from five to seven laborers in filling buggies, and does the work faster.

The portable box car loader is made in three styles—for handling sand, salt and similar materials; for handling lump lime, ores, and other lumpy materials; for superphosphate and materials of a gummy nature. With a box car loader and one man, a box car may be loaded within an hour. It has been



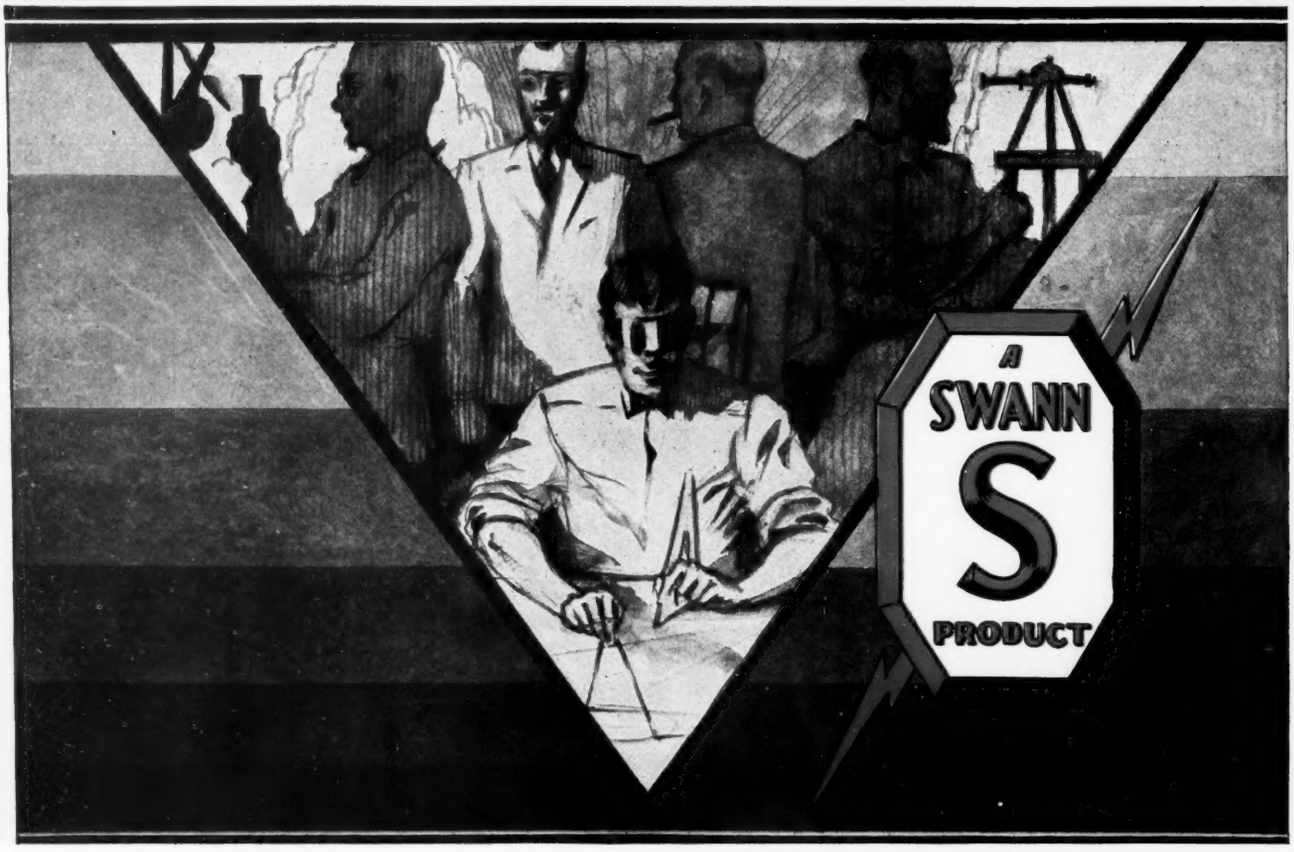
A portable bag piler which finds extensive use in piling bagged chemicals.

reported that it is possible to load forty tons of sand into a car without a shovel. One man can set the loader into position, fill one end of the car, reverse the loader and fill the other end. This replaces the costly wheel-barrow-plank-back-breaking way.

The power propelled crawler loader crawls in any direction, backs right up against the material; digs; feeds itself; and loads; and it performs these operations with astonishing speed. Built for the rough loading job, it is ideally adapted for handling oxide, fertilizer, acid phosphate and similar materials. The loader is easy to operate, requiring only one man. He has a clear view and rides with the loader on a roomy side platform where all levers are handy. The machine can travel forward and reverse; and turn right or left when travelling in either direction. The starting, turning and stopping of the crawler are all controlled by two hand levers, which automatically apply brakes when stopping. The elevator is controlled by a separate hand lever which operates a steel clutch and disengages automatically when the machine is started in reverse. The loader is composed of four units; i. e., the elevator, the chassis, the power plant and the crawler. The machine is made collapsible to clear low overhead trolley wires, bridges, etc., in moving from one location to another. It operates from a simple, compact gasoline power unit of 30 H. P. at 1200 RPM, equipped with a governor to regulate the feed automatically or with electric equipment to suit the conditions. It has a capacity of 1¾ yds. per minute with uniform feed, based on sand, gravel or similar material of about 1½ inch size.

At one plant where this type machine was used for reclaiming acid phosphate from bins to hand buggies, (thence to elevators) the loader reduced the blasting

Establishing a mark of Value



JUST as the various denominations of American money are indicated by their Government Stamp; so does each product of The Swann Corporation come to you identified by the established mark of value. You can be just as certain of the uniform high quality of Swann Products as you are that "Five Dollars" on a bank note is a true indication of its value. All that The Swann Corporation stands for is symbolized by the mark — A SWANN PRODUCT. Look for it!

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Di Calcium Phosphate
Tri Calcium Phosphate
Pyro Sodium Phosphate
Tri Sodium Phosphate
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Calcium Sulphate
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Sodium Aluminum Sulphate
Laundry Soap Builders

The SWANN CORPORATION
Birmingham, Alabama — Anniston, Alabama — St. Louis, Missouri.

of the pile by about 50 per cent. and entirely eliminated the need for loosening the material by means of picks. The only shoveling necessary was the cleaning up of some spilled material. Based on a daily wage of $2.50 for shovelers the saving in dynamiting, picking and shoveling was about $18.00 a day, as the loader replaced eight shovelers and four pickers,—at the same time delivering the phosphate to buggies at the rate of 32 tons per hour. The machine could have handled 50 tons an hour just as well, but the hourly capacity of the elevator into which the buggies deliver the material was limited to 32 tons per hour. The expense for dynamiting was cut in half as the power propelled crawler loader is equipped with a screw feeder which digs its way into the pile without further aid than the original dynamite blast.

The portable bag piler, as its name implies is used, extensively for piling bags of chemicals. This completes this group of portable conveying and elevating equipment whose use makes for economy and efficiency in the handling of certain types of materials in the chemical plant.

New Incorporations

Eastern States Poultry Manure Corp., New York, fertilizer—Corp. Trust Co. of America—$100,000, 110,000 shs com.

And How Products Corp., cleaning compounds—Barry, Wainright, Thacher & Symmers, 72 Wall St., Manhattan—1,000 shs com.

Gelatin Labs., chemicals—A. G. Peters, 254 W. 31st., New York—500 shs com.

The Natural Carbonic Ice Co., Newark, Manufacture artificial ice—Corp. Trust Co., Jersey City—1,100 shs com.

N. J. K. Dolbows Sons, Inc., Penns Grove, manufacture asbestos,—John M. Summerill, Camden—135,000 shs.

Vapro Co., Philadelphia, Pa. druggists, chemists—Corp. Guarantee & Trust Co. 1,000 shs com.

Chilhowee Co., Wilmington, tanning materials—Corp. Trust Co. of America —$1,800,000, 20,000 shs com.

American Aniline and Extract Co., Inc., Woodbury, N. J., dyestuffs—Horace G. Eastburn, Wilmington, Del.—1,000 shs com.

Cunningham Cleanser Corp., Mineola, soaps, dyes—Petit, Milsaps & Petit, Far Rockaway—30,000 shs.

Dust-Nix Products, Watertown, dust preventers—R. A. Fuller, Watertown—20,000 pf., 500 shs com.

Goodyear Sales Corp. chemicals—Frost, Watson & Lobby, Albany—100 shs com.

Standard Lignite Co., McAlester, Okla., minerals—United States Corp. Co., Dover, Del.—100 shs com.

Associated Medicine Industries, chemicals—J. P. Ryan, 72 Central Park West—1,000 shs com.

The Vitalite Co., Jersey City, manufacture chemically coated metal cloth etc,—Corp. Trust Co., Jersey City—20,000 shs com.

Corona Tankage, Inc., Wilmington, fertilizer—Colonial Charter Co.—$25,000, 625 shs com.

Agencia Del Progresso, chemicals—J. A. Byrne, 305 Broadway, New York,—$10,000.

East End Paint Co., Camden, N. J.—Phillip L. Garrett, Wilmington, Del.—500,000 shs.

Firemaster Corp., Brooklyn, N. Y., chemicals,—machinery for extinguishing fires—United States Corp. Co.,—5,000 shs com.

Dundee Limestone Co., Wilmington, Del., limestone—Colonial Charter Co.—200,000 shs.

German American Chemical Corp., Wilmington, Del.—Corporation Service Co.—100,000 shs com.

Fluid Chemical Co. Inc. Newark, manufacture chemicals—Rossbach & Co., Newark—100,000 shs.

Mancellize Ltd., Montreal, chemicals, Rene Chenevert, Max Bernfeld, Harry Batshawl—50,000 shs no par value.

The Sulphide Research Corp., Ltd., Montreal, Que, Can.—Gordon M. Pender, Alfred M. West, Wm. L. Paterson—$150,000.

Roller Process Corp., chemicals—L. S. Amriech 11 Park Pl., Manhattan—$20,000.

Mid-West Carbide Corp., Wilmington, Del., minerals, by-products—Corporation Trust Co. of America—$400,000, 40,000 shs com.

Levis Robinson Co., turpentine—D. J. Marks 1,545 Broadway, New York—20,000 shs.

Brovar Chemical Co.,—S. Sustick 1,440 Broadway, New York—25,000 shs.

Northern Pigment Co. Ltd., Toronto, Can., chemicals—George M. Willoughby, Clifton H. Lane, Helen G. Dawson—$50,000.

New Jersey Exterminating Co., Newark, N. J., exterminating vermin, etc. Louis L. Feinseth, Newark, N. J.—50,000 shs.

Krebs Pigment & Chemical Co., Wilmington, Del.,—M. D. Fisher, Wilmington, Del.—1,000 shs com.

Fome-Kleen, Buffalo, disinfectants—C. G. Blair, Buffalo—$10,000 pf., 500 shs com.

Freight Rate Decisions

Public Service Commission, New York, approves effective June 15 to 19, the cancellation by the New York Central (East) and West Shore railroads of the commodity rate on soda products, viz: Washing crystals, washing powder and washing soda, carload and less than carload, from Solvay and Syracuse to various stations on their lines and the lines of other carriers and the restoration of class rates under which increases are effected.

Commission also approves new freight rates on salt (crude rock), carload, as follows: Erie Railroad from Halite and Rotsof (on Genesee & Wyoming) to Suspension Bridge, 6.5c; reduction 1.5c per cwt., effective April 29, by special permission of the commission.

Pennsylvania Railroad from Sterling Salt Co. (Halite) to Suspension Bridge on Erie, Lehigh Valley and New York Central, and to Echota on Lehigh Valley, 6.5c; reduction 1.5c per cwt. Effective May 2 by special permission of the commission.

Commission also approves the following new freight rate on sulphuric acid:—Erie Railroad, in tankcars, carload, from Black Rock, Buffalo and East Buffalo to Gowanda, 9.5 cents a hundredweight; reductions effective June 15.

Ninth class freight rates of the Southern classification should apply on carload shipments of soda and soda products to destinations in the South from points of origin both in the South and in the North, the Interstate Commerce Commission decides in a group of complaints brought by the Mathieson Alkali Works, Saltville, Va., and a number of alkali producers in Central territory.

P. H. & F. M. Roots Co., Connersville, Ind., issues new 16-page bulletin, No. 22-B-1, on low pressure type rotary positive blowers. Bulletin covers the modernized blowers of the company, giving dimension print, speeds, capacities and horsepowers at various pressures, together with a brief review of various types of pumping units.

U. S. Stoneware Co., New York, publishes Bulletin "D", describing company's new line of centrigfual acid pumps, lined with chemical stoneware, and suitable for the pumping of all acids, alkalies and chemicals, except hydrofluoric acid.

T. Shriver & Co., Harrison, N. J., issues a new, attractively bound, 36-page general catalogue, No. 29, describing the companies line of filter presses. Copies may be secured upon application to the company.

Revolvator Co., Jersey City, issues bulletin 93-C describing the "New Red Giant Revolvator and Portelator". Copies may be secured upon application to the company.

Glidden Co. obtains from Maryland legislature the right, subject to certain restrictions, to dredge in Chesapeake Bay for titanium oxide.

Council of the American Chemical Society votes to recommend that the name of Josiah Willard Gibbs be included in the list of illustrious Americans in the Hall of Fame.

International Gypsum Co. plans erection of plant in Savannah to cost approximately $150,000.

Dearborn Chemical Co., Chicago, plans construction of two story plant addition to cost approximately $50,000.

Rumford Chemical Works, East Providence, R. I., plans to erect a three-story factory addition to be 25 by 32 feet.

U. S. Industrial Alcohol Corp. elects Matthew C. Brush to the board of directors, succeeding Guy Cary, resigned.

French Benzol Production Increased 14 Per Cent. in 1927

French production of benzol increased 14 per cent. during 1927 as compared with that of 1926—the result of a 23 per cent. in the output of gas plants and 13 per cent. by coke ovens and coal-tar distilleries, which latter source still represents about four-fifths of the total output. A 42 per cent. increase in automobile consumption occurred during 1927. Other requirements showed only very slight gains, according to the Department of Commerce.

The French Union of Benzol Producers (Union Francaise des Producteurs de Benzol), whose members supply 86 per cent. of the benzol output in France, was formed March 25, 1927, under the auspices of the central committee of the producers and distillers of coal tar in France (Comite Central des Producteurs en France), because of the increasing importance of technical questions, both economic and legislative, relative to benzol. Coke-oven installations and new gas plants under construction indicate a further increase in the production of benzol during 1928. The regulation requiring all new gas plants to be equipped with a benzol recovery plant, and the new coke-ovens, account largely for the increased production from 53,300 metric tons in 1926 to 61,200 in 1927. In the following table are assembled data for French production of benzol, exclusive of the Saar, and the consumption of this output:

Item	*1926* Metric tons	*1927* Metric tons
Production:		
Gas plants	10,300	12,700
Coke ovens and tar distilleries	43,000	48,500
Total	53,300	61,200
Consumption of French production:		
Benzol (90 and 50)	22,550	24,300
Benzol (motor)	13,400	20,000
Toluol	1,200	2,300
Solvent	4,900	6,000
Pure products (benzene, toluene, xylene)	2,450	3,000
Other products (light oils, crude products)	8,800	5,600
Total	53,300	61,200

The production of benzol in the region of the Saar has remained about the same for the years 1926 and 1927, at 34,000 tons, of which 4,000 originated in State mines.

A part of this production remained in the Saar district. The exact amount sold elsewhere is not obtainable as this territory is included in the French custom's boundary. The administration of the French State Mines of the Saar is apart of the recently formed association. Furthermore, the committee of ironworks of the Saar, a group representing the privately owned metallurgical coke ovens of the Saar, has a representative at the meetings of the Union of the Producers of Benzol. The French union is in communication with similar English and German associations, the National Benzol Association, and the Benzol Verband.

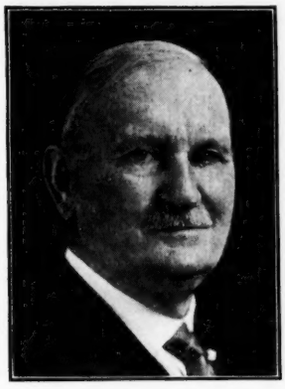
Sulfur deposits in Mexico, below San Felipe near the coast on the west shore of the Gulf of California, may soon be exploited, according to the Department of Commerce.

Chemical Facts and Figures

Hawley Tariff Bill Passes House and Goes Before Senate Committee

Proposed Tax on Blackstrap Molasses Stricken from Measure During Debate in House—Revision Shows Upward Tendency But With No Startling Differences From Existing Schedule on Chemicals and Allied Products.

Hawley Bill, providing for tariff revision, is passed by the House of Representatives, May 28, by a vote of 264 to 147. Having been introduced into the House on May 7, by Representative Willis C. Hawley, (Republican, Ore.) chairman, Committee on Ways and Means of the House, and finally after three weeks of debate, being passed by the House, the tariff measure went at once to the Senate for consideration by that body. There it was referred to the Finance Committee, of which Senator Smoot of Utah is chairman, and indications are that it will not reach the upper chamber for debate until the latter part of June. With talk in the air of a three-months' recess by Congress it seems unlikely that the bill passed by the House can be made law before the latter part of September at the earliest.



Willis C. Hawley

During the weeks of debate in the House, the one change which was particularly objected to, insofar as the chemical industry was concerned, the proposed tariff on blackstrap molasses, was finally stricken from the proposed bill, so that that clause remains as in the existing law, as the bill goes to the Senate Committee.

Important changes in the Hawley bill as compared with the existing tariff as affecting chemical and allied products are as follows:

Citric Acid—Present rate 17 cents a pound, new 18 cents; Formic Acid—Present 25 per cent., new 4 cents a pound; Oleic Acid, or red oil, and stearic acid—Rate is changed from 1½ cents a pound to 25 per cent. ad valorem; Tannic Acid, Tann and Extracts of Nutgalls (containing by weight of tannic acid less than 50 per cent)—Present 4 cents a pound, new 6 cents; Tannic Acid (50 per cent. or more and not medicinal)—Present 10 cents, new 12 cents; Tannic Acid (50 per cent. or more and medicinal)—Present 20 cents, new 22 cents; Tartaric Acid—Present 6 cents a pound, new 8 cents; Gallic Acid—Present 8 cents a pound, new 10 cents; Nitric Acid—One-half of 1 cent a pound (new provision); Oxalic Acid—Present 4 cents a pound, new 6 cents.; Phosphoric Acid (containing by weight of phosphoric acid 80 per cent or more)—Present 2 cents a pound, new 3½ cents; Pyrogallic Acid—Present 12 cents a pound, new 15 cents;

Alcohol (methyl or wood, or methanol)—Present 12 cents a gallon, new 18 cents.; Ammonium Carbonate and Bicarbonate—Present 1½ cents a pound, new 2 cents; Synthetic Gums and Resins (not especially provided for)—Four cents a pound and 30 per cent. ad valorem (new provision); Barium Carbonate (precipitated)—Present 1 cent a pound, new 1½ cents; Barium Chloride—Present 1¼ cents a pound, new 2 cents; Barium Dioxide—Present 4 cents a pound, new 6 cents; Barium Oxide—2⅛ cents a pound (new provision); Calomel, Corrosive Sublimate and other mercurial Preparations—Present 45 per cent ad valorem, new 22 cents a pound and 25 per cent ad valorem; Chalk, or Whiting, or Paris White (dry, ground or bolted)—Present 25 per cent ad valorem, new 40 per cent ad valorem; Diethylbarbituric Acid (and salts and compounds thereof)—$2.50 a pound (new provision); Phenol, Metacresol, Orthocresol—Present 7 cents a pound, new 20 per cent ad valorem and 3½ cents a pound;

Compounds of Casein (made into finished or partly finished articles)—Present 40 cents a pound and 25 per cent ad valorem, new 40 cents a pound and 50 per cent ad valorem; Sulfate or Epsom Salts—Present 1½ cents a pound, new 1 cent; Keiserite—¼ cent a pound (new provision); Oxide or Calcined Magnesia—Present 3½ cents pound, new 7 cents; Synthetic Camphor—Present 6 cents a pound, new 1 cent; Menthol—Rate increased from 50 cents to 75 cents a pound.; Olive oil, weighing with immediate container less than 40 pounds—Increased from 7.5 to 8.5 cents a pound; Linseed or Flaxseed Oil—Present 3.6 cents a pound, new 4.16 cents; Soy bean Oil—Present 2½ cents a pound, new 5 cents; Palm-Kernel Oil—1 cent a pound (new); Sesame Oil—3 cents a pound (new); Sperm Oil, Refined—Present, 10 cents a gallon; new, 14 cents; Spermaceti Wax—6 cents a pound (new); Wool Grease—Present, ½ to 1 cent a pound; new, 1 to 3 cents; Grapefruit Oil—25 per cent ad valorem (new); Phosphorus Oxychloride and Phosphorus Trichloride—6 cents a pound (new);

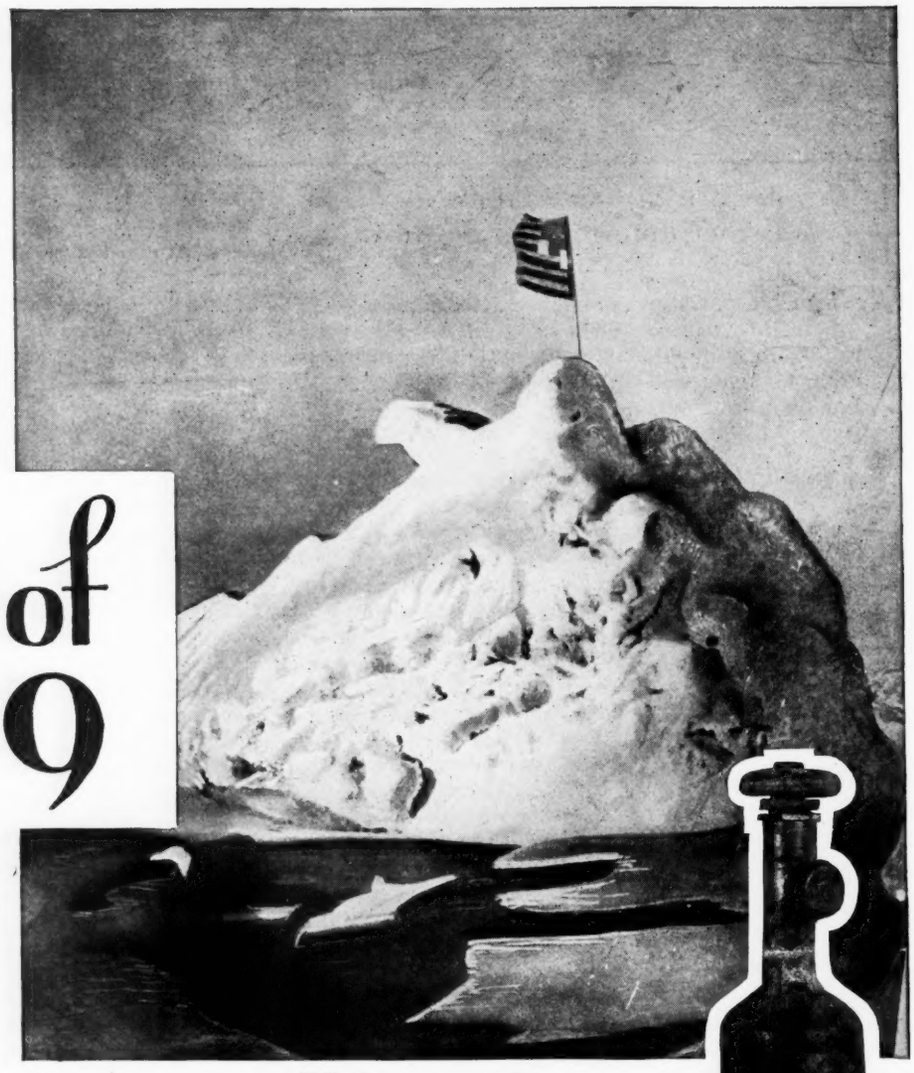
Precipitated Barium Sulfate or Blanc Fixe—Present, 1 cent a pound; new, 1¼ cents; Decolorizing and Deodorizing Chars and Carbons—Present, 20 per cent ad valorem; new, 45 per cent; Vermillion Reds Containing Quicksilver—Present, 28 cents a pound; new, 22 cents a pound, and 20 per cent. ad valorem; Cuprous Oxide—35 per cent ad valorem (new); Lithopone and other Combinations or Mixtures of Zinc Sulfide and Barium Sulfate containing by weight 30 per cent. or more of Zinc Sulfide—Present, 1¾ cents a pound; new, 1 and ¾ cents a pound, and 20 per cent ad valorem; Potassium Chlorate and Perchlorate—Present, 1½ cents pound; new, 2¼ cents a pound; Potassium Nitrate or Saltpeter, Refined—Present, ½ of 1 cent a pound; new, 5½ cents; Potassium Permanganate—Present, 4 cents pound; new, 6 cents; Potassium Citrate—18 cents a pound (new);

Sodium and Potassium—25 per cent. ad valorem (new); Sodium Formate—Present, 2 cents a pound; new, 2¾ cents; Sodium Nitrate—Present, 3 cents a pound; new, 4½ cents; Sodium Sulfate, Anhydrous—Present, $2 a ton; new, $4, a ton; Sodium Oxalate—3½ cents a pound (new); Sodium Phosphate, Except Pyro Phosphate, containing by weight less than 45 per cent. of water—present, ½ cent a pound; new, 1 cent; Sodium Phosphate, not specially provided for—Present, ½ cent a pound; new, 2 cents; Silicofluoride—1¾ cents a pound (new); Potato Starch—Present, 1¾ cents a pound; new, 2½ cents; Other Starches not specifically provided for—Present 1 cent a pound; new, 1½ cents; Strychnine and Salts of—Present, 15 cents an ounce; new, 20 cents; Dextrine, made from Potato Starch or Potato Flour—Present, 2¼ cents a pound; new, 3 cents; Dextrine, not otherwise provided for, Burnt Starch or British Gum, Dextrine Substitutes, and Soluble or Chemically Treated Starch—Present, 1¼ cents a pound; new, 2 cents; Zinc Sulfine—Present, 1½ cents a pound; new, 3 cents; Collodion Emulsion 25 per cent. ad valorem.

Imperial Chemical Industries, Ltd., and British Celanese, Ltd., are rumored to be planning a merger, according to reports from London.

Events of 1909

Peary Reaches the North Pole



Over 20 years ago E B G pioneered in the manufacture of Liquid Chlorine

The first pound of Liquid Chlorine produced in the U. S. A. 1907

E B G advanced the science of bleaching to its furthest point when it produced the first Liquid Chlorine ever made in this country on a commercial scale.

It was an event. And, to industry, of as much interest as the arrival at the North Pole of Commodore Peary, also in 1909.

E B G has not been content to rest upon its laurels. It has been steadily at work adapting the qualities of Liquid Chlorine to the requirements of new industries. And the natural advantages of Liquid Chlorine have been increased by the technical and general cooperation of the entire E B G organization.

Liquid Chlorine

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New York, N. Y.
Plant:
Niagara Falls, N.Y.

Electro Bleaching Gas Co.

PIONEER MANUFACTURERS of LIQUID CHLORINE

Personal and Personnel

Dr. Claude S. Hudson, chief, chemistry division, Hygenic Laboratory, U. S. Public Health Service, is presented with the eighteenth annual Willard Gibbs Medal, May 25, at a reception and dinner given by the Chicago section, American Chemical Society, at the Palmer House, that city. Dr. B. B. Freud, chairman of the section presided, and speakers included Prof. William L. Evans, Ohio State University; Dr. Hudson; Dr. Walter D. Scott, president, Northwestern University; Dr. Gordon J. Laing, University of Chicago; and Prof. Joseph H. Mathews, University of Wisconsin.

M. Donat Agache, chairman, Etablissements Kuhlmann, and outstanding figure in the chemical industry of France, dies April 22, aged 47. He was born in Lille, January 25, 1882, his father M. Edouard Agache, being the son of Frederic Kuhlmann, founder of the Kuhlmann interests. He was appointed to the board of the company in 1913 and it was his direction which lead to the conclusion of the dyestuffs agreement with the I. G. in 1927.

John Stauffer, Sr., and John Stauffer, Jr., sail for Europe, June 7, aboard the S. S. "Paris", to make a tour of that continent which will include an inspection of the European plants of the Stauffer Chemical Co. They will also confer with Count Christian DeGuigne, president, Stauffer Chemical Co., and S. Peiser, president, Consolidated Chemical Industries.

L. V. Redman, vice-president, Bakelite Corp., is elected president of the Chemists' Club, New York, succeeding Dr. T. B. Wagner. Other officers elected are: resident vice-president, H. C. Bishop; non-resident vice-president, Edward R. Weidlein; and secretary, Robert T. Baldwin.

Major General Harry L. Gilchrist, chief, Chemical Warfare Service, is tendered a dinner, May 22, in the Carlton Hotel, Washington, D. C., in honor of the confirmation of his appointment as chief of this branch of the service.

Lammont du Pont, president, E. I. du Pont de Nemours & Co., Inc., is chosen to represent the second election district, comprising New York, New Jersey, Pennsylvania and Delaware, on the Chamber of Commerce of the United States.

J. C. Pridmore, director, southern division, Soil Improvement Committee, National Fertilizer Association, tenders resignation, effective July 1, to become associated with American Potash & Chemical Corp.

Arthur S. Somers, president, Fred L. Lavanburg Co., dry colors, New York, is elected a director, Brooklyn Capital, Inc., an investment corporation.

Bradley Dewey, president, Dewey & Almy Chemical Co., Cambridge, Mass., is elected a member, executive committee, Massachusetts Institute of Technology.

George Eastman, Eastman Kodak Co., gives $200,000 to the Association of American Rhodes Scholars, to establish the George Eastman Visiting Professorship at Oxford University.

Franklin St. Clair Clark, authority on wood distillation and founder in 1902 of the Georgia Pine Turpentine Co., dies at Fayettesville, N. C., April 25.

Charles H. Ault, president and treasurer, Jaenecke-Ault Co., printing inks, Newark, dies at his home in Summit, N. J., May 14, aged 68.

L. H. Cone resigns as vice-president, National Aniline & Chemical Co.

General Industrial Alcohol Corp. Formed by Merging Four Companies

General Industrial Alcohol Corp., is organized under the laws of Delaware for the purpose of acquiring the business and assets of General Industrial Alcohol Co., Inc., at Marrero, La., and National Industrial Alcohol Co., Inc., at New Orleans, and the plants of Greendale Co. at Lawrenceburg, Ind., and Michigan Chemical Co. at Bay City, Mich. (CHEMICAL MARKETS, March 1929). New company has applied for government permits entitling it to produce approximately 5,000,000 gallons of alcohol per annum. Walter J. Trautman, New Orleans, is president of the organization.

New corporation will also acquire complete ownership of Molasses Distributors Corp., which has purchased the domestic bulk blackstrap department of American Molasses Co. of New York and certain subsidiaries, excluding foreign collecting facilities and tank ships, but including a fleet of 57 tank cars and tidewater terminals at Boston, Brooklyn and New Orleans, providing economical storage and distribution for over 30,000,000 gallons of blackstrap per annum.

Capitalization of new company upon completion of financing will consist of $2,500,000 convertible 6½% sinking fund debentures, due 1944, and an authorized issue of 285,000 shares of no-par common stock, of which 115,000 shares will be outstanding and 75,000 shares are reserved for conversion of each debenture into 30 shares of common stock.

Manufacturing Chemists and S. O. C. M. A. Hold Joint Meeting

Manufacturing Chemists' Association and Synthetic Organic Chemical Manufacturers' Association hold annual meetings at the du Pont-Biltmore Hotel, Wilmington, June 6 and 7. The frature of both meetings was the union dinner on the evening of June 6 at which time an address was made by Hon. John Q. Tilson, majority leader, House of Representatives. In addition, the Manufacturing Chemists' Association heard an address by Virgil Jordan, National Industrial Conference Board, on the subject of "Business Situation and Outlook", at the session on the morning of June 6.

Both associations also held business meetings on the morning of June 6, but only the Manufacturing Chemists' Association held a business meeting on the following day. At that time Salmon W. Wilder, chairman, executive committee of the association, reviewed the Hawley Bill. The Synthetic Organic group, meanwhile was holding its annual golf tournament at the Wilmington Country Club.

Salesmen's Association Plans Annual Spring Outing for June 27

Salesmen's Association, American Chemical Industry, will hold its annual outing and golf tournament at the Canoe Brook Country Club, Summit, N. J., June 27. As in previous years, there will be a number of prizes awarded on a point basis for skill in golf, horse-shoe pitching, discus throwing and other field events. W. F. L. Tuttle and Grant Dorland form the committee in charge of this annual event.

National Aniline & Chemical Co. institutes actions May 1, in the U. S. District Court, to recover $3,465,503, representing income taxes, excess profits taxes, and penalties for 1918 and 1919. The United States is named as defendant in one action for recovery of $1,866,283, and Frank K. Bowers, as collector of internal revenue, is named as defendant in second suit for recovery of $1,599,220.

Vanillin is dutiable under paragraph 61, as a perfume material, and not as a coal tar product, according to decision of U. S. Customs Court, in case brought by McKesson & Robbins, Inc.

News of the Companies

Sylvania Industrial Corp., New York, capitalized at $3,500,000 plans to erect a $1,000,000 plant at Fredericksburg, Va., in which to manufacture chemical specialites. Dr. Roger N. Wallach, formerly vice-president, Grasselli Dyestuffs Corp., is president, and Frank H. Reichel, general manager, of the new organization, whose offices are at 122 East 42nd st., New York.

E. I. du Pont de Nemours & Co., Inc., announces formation of an agricultural extension section to its explosives department. The section will be in charge of Larry F. Livingston and will study problems connected with the use of explosives in agricultural work, and to aid farmers and others in the economical use of these products.

Helium Co., Louisville, announces discovery of an unusually rich deposit of helium gas in Utah, near the government reserves. The extremely rich helium content in the Utah natural gas, it is estimated, may reduce the cost to one-third of the present three and one-half cents a cubic foot.

Roessler & Hasslacher Chemical Co. moves offices to new quarters at 10 East 40 st., New York. Company's executive offices are located on fifteenth floor, sales department on the fourteenth, and traffic and accounting departments on the thirteenth floor.

General Aniline Works is granted drawback on exports of beta-amido manufactured at Grasselli, N. J., with use of imported betachloranthraquinone. Allowance is effective from January 21, 1929.

American Solvents & Chemical Corp., New York, acquires all buildings, equipment and property of Cragin Products Co., Chicago, and plans manufacture of grain alcohol at that point.

Agfa Ansco Corp. obtains options from City of Binghamton for purchase of six acres adjoining company's plant. Options were purchased for $26,000.

Dow Chemical Co. publishes handsomely bound book called "Dow Chemicals" which contains a complete list of the company's products.

Charles Hardy, Inc., New York, is appointed sales agent for R. K. Miller Minerals Co., Cartersville, Ga., producers of crude barytes, ochre and manganese ore.

Grasselli Chemical Co., Inc., issues booklet containing a history of the organization and the latest, most complete listing of its products.

Rolls Chemical Co., Buffalo, features current issue of "Retorts" with information concerning the Buffalo territory, particularly as a chemical producing center.

Clarence Morgan & Co., Chicago, is appointed exclusive sales agent in the State of Illinois for the newly organized General Industrial Alcohol Corp.

Pacific Coast Borax Co. announces removal of offices to New York Life Building, 51 Madison ave., New York.

Commercial Solvents Corp. elects Philip L. Reed, treasurer of Armour & Co., to the board of directors.

Monsanto Chemical Co. opens a cafeteria for employees at its home offices in St. Louis.

Chas. L. Read & Co., New York, announces removal of offices to 30 Church st., that city.

Union Carbide Acquires Two New Properties in Expansion Program

Union Carbide & Carbon Corp., through a subsidiary, acquires all the outstanding capital stock of Meraker Smelting Co., Ltd., which owns and operates four hydro-electric power stations located on Kopperaaen River in the Trondjhem district at Norway. Two of the stations are located at Kopperaaen, one at Turifos and one at Nustadfos. They supply power to the company's three manufacturing plants which produce calcium carbide and ferro-alloys.

The company has also acquired through its subsidiary, United States Vanadium Corp., the Long Park holdings of Vanadium Alloys Corp. These properties adjoin those previously owned by Standard Chemical Co., which also were recently acquired by U. S. Vanadium and are all located in the Paradox Valley district, Colorado.

Calco Extends Activities with Purchase of Crown Chemical Co.

Calco Chemical Co., Bound Brook, N. J., purchases plant and good-will of the Crown Chemical Co., Keyport, N. J. Previously the Monmouth Chemical Co., New York, had acted as selling agent for Crown products, but with the sale, Calco will handle the sale of the products exclusively. The Monmouth Chemical Co. will continue its import and trading business in heavy chemicals, although no longer representing Crown Chemical.

No change will be made in the manufacture of Crown products which include paranitraniline, paraphenylenediamine, metanitroparatoluidine, para-aminophenol, and acetanilid. The Calco company plans to extend materially the facilities for the manufacture and distribution of these products.

Monsanto Acquires Rubber Service Laboratories and Elko Chemical Co.

Monsanto Chemical Works acquires Rubber Service Laboratories Co. and its subsidiary, Elko Chemical Co., through exchange of stock. Directors of Monsanto and Rubber Service have approved contract and stockholders of Rubber Service are expected to formally ratify action before June 20.

Rubber Service was established in 1922. Company has expanded rapidly and now manufactures 20 rubber chemicals. Elko manufactures important organic chemicals. Rubber Service offices are in Akron and plant is at Nitro, W. Va. First quarter 1929 sales of Rubber Service and subsidiary were at the rate of $2,000,000 annually.

Dr. Rudolph Breves, president, Waukegan Chemical Co., lacquer manufacturer, Waukegan, Ill., dies April 25, aged 61. He was born in Osterwald, Germany, December 23, 1867 and came to the United States in 1899, becoming chief chemist, Egyptian Lacquer Manufacturing Co. In 1915 he went to Chicago as chemical director, Wilder Tanning Co., leaving there to accept the position of chief chemist, National Oil Products Co. In 1919 he became president of the newly organized Waukegan Chemical Co., which position he held at his death.

American Cyanamid Co. secures right to register "retardox" as trademark for aldehyde-amine condensation products under decision, May 2, by M. J. Moore, assistant commissioner of patents. Application has been contested by Rubber Service Laboratories, Inc., Akron, Ohio, which had registered "resistox" for same class of goods. It was held that the Cyanamid company had used name prior to other registration.

Roessler & Hasslacher Chemical Co. holds annual outing at Glen Cove, L. I., May 25, at which time thirteen employees were presented with platinum watches in recognition of twenty-five or more years service with the company.

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Trisodium Phosphate

Disodium Phosphate

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BOWKER'S Trisodium Phosphate stands every test for cleaning, water softening and boiler compounds.

Bowker's Disodium Phosphate meets the full requirements of the most exacting and biggest silk weighters and finishers in the industry.

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To the man who says:

"We've done it this way for years!"

"WE'VE done it this way for years—we can do it this way for years to come!"

But you can't!

The world of scientific research is moving at a faster pace than you may realize. And the smooth production of Today is going to be hog-tied against Tomorrow's methods.

We offer you, without cost or obligation, an opportunity to sanely discuss methods for improving your present production scheme. If things can be improved upon, *though it takes a new discovery to do it,* we will improve them. *We've done it*—time and again.

If you would take advantage of this offer, write or wire us. A consultation will be arranged to suit your convenience.

We are specialists in fractionating narrow distillation ranges of Petroleum Products. We will procure information on any special distillate you may require. We supply generous samples and advice on how they are used. Shipment may be had in drums and tank car lots, and in large industrial centers, in tank wagons.

To meet production problems that "didn't exist", we have pioneered the discovery and commercial development of:

LACTOL—a 100% petroleum product; a thinner for use as a diluent and a vehicle to carry the active solvent in the manufacture of lacquers; has the same evaporating time as Toluol; generally used by large manufacturers of lacquers; many find it superior and more economical than Toluol.

TEXTILE—a petroleum thinner for use in replacing Benzol, Toluol, and other coal tar solvents; has the same evaporating time as Benzol; widely used by large industries; artificial leather manufacturers, textile manufacturers, etc., as a substitute for Benzol; more efficient and more economical.

KEMSOLENE—a petroleum thinner for use as a diluent and a vehicle to carry the active solvents in the manufacture of lacquers; has an exceptionally high flash.

AMERICAN MINERAL SPIRITS COMPANY
308 So. Michigan Ave., Chicago

Eastern Representatives:
Chemical Solvents, Inc., 297 Fourth Ave., New York City

Canadian Representatives:
Wilson, Paterson, Gifford, Limited, Montreal · Toronto

Anglo-Chilean Nitrate Pushes Plans for Expanding Holdings

Anglo-Chilean Nitrate Corp. is taking active measures to expand its holdings of Chilean nitrate properties. The company has bid £2,500,000 for an undeveloped nitrate area, owned by the Chilean Government and known as the Nebraska field, and is believed to have secured control of the properties of Lautaro Co., Ltd. The bid made by Anglo-Chilean has not as yet been officially accepted by the government, but it is known to be the largest which has been made for the Nebraska field which is said to contain 80,000,000 quintals of recoverable nitrogen.

Meantime, the Lautaro Nitrate Corp. has been incorporated under the laws of the State of Delaware with 400,000 shares of no par value stock. It is believed that this represents the successful conclusion of Anglo-Chilean to secure the British company of the same name, and that the Delaware company has been formed as a new holding company to acquire the present shares of both Anglo-Chilean and Lautaro.

Grace Nitrate Co. Transfers Properties to British Company

Grace Nitrate Co., New York, transfers its nitrate properties in Chile to Tarapaca & Tocopilla Nitrate Co., a British company. Both concerns will be operated by W. R. Grace & Co., according to reports, the property is situated in the Province of Tarapaca, comprising extensive and important nitrate grounds, with an area of 19,154,490 square meters. The consideration for the property is to be satisfied with an allotment of 977,000 shares of 10 shillings each by the Tarapaca and Tocopillia to the Grace interests.

American Institute of Chemists holds annual meeting, at the Chemists' Club, New York, May 10, and elects following officers: chairman, M. L. Crossley; vice-chairman, Frederick W. Zons; secretary-treasurer, Karl M. Herstein; national councilor, Benjamin T. Brooks. Williams Haynes, publisher, CHEMICAL MARKETS, was the speaker of the evening on the subject of "The Chemist and Chemical Business."

President Hoover issues a proclamation May 14, effective in thirty days, increasing the rate of duty on flaxseed from 40 cents to 56 cents per bushel of 56 pounds. Increase was based on an investigation of Argentine and domestic costs conducted by the United States Tariff Commission. New rate of duty is the same as that carried in the tariff revision bill now before Congress.

Patent litigation which has disturbed the gypsum industry for some time has been settled, according to U. S. Gypsum Co., and licenses under patents for the manufacture of various commodities have been granted important producers.

Hazard Advertising Corp.'s booth at the Twelfth Exposition of Chemical Industries in the Grand Central Palace, New York, May 6-11. This is the first advertising agency ever to exhibit at the exposition.

National Fertilizer Association Holds Fourth Annual Convention

National Fertilizer Association holds fourth annual convention at The Griswold, Eastern Point, New London, Conn., June 10-13. The program for the four-day session opens with registration on June 10. On that day, there are also meetings of the Soil Improvement, and Budget committees, and of the Board of Directors.

The theme for Tuesday, June 11, is "The Industry's Stake in Agriculture's Welfare." This includes addresses by E. L. Robins, president of the association, on "Association Activities;" Louis J. Taber, Master of the National Grange, on "Industry's Interest in Agriculture"; Dr. E. C. Brooks, president, North Carolina State College of Agriculture, "Economic Development of Agriculture"; and E. S. Bayard, on "The Farm Paper."

Included among the speakers on Wednesday's theme of Phosphate Rock and Superphosphate, are John T. Burrows, vice-president, International Agricultural Corp., on "Phosphate Production Technology"; Morgan H. Grace, president, Phosphate Export Association, on "International Aspects"; K. D. Jacob, Department of Commerce, on "Chemistry and Economics of Superphosphate"; E. L. Larison, Anaconda Copper Mining Co., on "High Analysis Superphosphate"; and James H. Collins on "The Superphosphate Institute." At the annual dinner in the evening, Merle Thorpe, editor, Nation's Business, spoke on "From the Bottom Up—or From the Top Down."

Speakers at the last session on June 13, included Dr. Harry A. Curtis, Yale University, on "Developments in Fertilizer Production"; Dr. J. G. Lipman, N. J. College of Agriculture and Experiment Station, on "A Chapter in Fertilizer Economics"; Dr. Harrison E. Howe, secretary, American Chemical Society, on "Muscle Shoals and the New Nitrogen Picture"; and Dr. L. D. H. Weld, H. K. McCann Co., New York, on "Capitalizing Consumer Research."

Lacquer Raw Materials Committee Organizes at Columbus Meeting

Lacquer raw materials monograph committee, division of paint and varnish chemistry, American Chemical Society, organizes at first meeting held April 30 at Columbus Athletic Club, Columbus, Ohio. Work to be undertaken by the committee will be divided among seven sub-committees, each dealing with a separate part of the raw material field, viz. cellulose esters, resins, pigments, plasticizers, oils, solvents and diluents. While representation on the committee is to be considered purely individual in character, it is desirable that representatives familiar with the production of these various types of materials take part in the work. The membership already includes a number of men interested, not only in raw material fields, but also others particularly interested in the manufacture and use of lacquer. Any correspondence, offers of assistance or requests to join the committee should be addressed to H. A. Nelson, Secretary, R. M. M. Committee, c/o New Jersey Zinc Co., Palmerton, N. J.

E. I. du Pont de Nemours & Co., Inc., announces following changes in personnel: Maxwell Moore, formerly vice-president and member of the executive committee, Du Pont Cellophane and Du Pont Rayon companies, is transferred to the treasurer's department of the home company. He is succeeded by Clayton M. Albright, formerly secretary and treasurer of both subsidiary companies, who is in turn succeeded by O. E. Adamson, formerly general assistant treasurer of both companies.

G. Siegle Corp., New York, is granted drawback from October 1, 1928, on exports of powdered dry colors and pigments made with the use of imported coal tar dyes or intermediates.

J. T. Baker Chemical Co., Phillipsburg, N. J., announces election of Ralph Bristol to board of directors.

Bakelite's Suit Against Importers Goes to Court of Customs Appeals

Bakelite Corp. through a decision of the Supreme Court, May 20, loses its attempt to prevent Frischer & Co. and other importers from appealing findings of the United States Tariff Commission that articles of synthetic phenolic resin of form C were imported under conditions of unfair methods of competition. The supreme court upheld the constitutionality of section 316 of the tariff act of 1922 in which an appeal is given from the findings of the Tariff Commission to the United States Court of Customs Appeals, now known as the United States Court of Customs and Patent Appeals.

The commission found that the importations infringed the Bakelite patents, and a temporary embargo was ordered by the President. Before this could be made permanent, the importers appealed the findings, principally on the point that the Tariff Commission has no power to take cognizance of patent infringements. The Bakelite Corp. then challenged the appeal, and before hearing the case on its merits, the court of customs appeals ruled on the questions of its jurisdiction. It declared that it is an inferior court such as is defined in the United States Constitution, and as such is limited to matters that are technically cases, and that the proceedings in the Tariff Commission constituted a case.

The Bakelite Corp. asked the supreme court for a writ of prohibition to prevent the lower court from hearing the case. In denying this to-day the supreme court reversed the findings of the court of customs appeals but with the same effect as this court's decision. The appeal of the importers will now be heard on its merit by the court of customs and patent appeals.

Bureau of Labor Statistics Reports Spray-Painting Findings

United States Bureau of Labor Statistics announces following results of its study of spray-painting practices and hazards: (1) the best practices largely overcome the hazards of the process; (2) most large and some small plants have installed high-grade equipment, while some small plants have taken no steps whatever toward protection; (3) the development of non-poisonous substitutes for lead and benzene has for most purposes reached a point where it is not necessary to spray materials containing harmful ingredients; (4) where materials containing benzene or lead compounds are used, stringent regulation should be maintained; and (5) several States have already adopted, or have inaugurated a definite movement to adopt, special regulations or have worked out a definite means of controlling the process and protecting the spray operators. The complete report is contained in the May issue of the "Monthly Labor Review", published by the bureau.

S. Castorina Argol Corp., capitalized at $2,500,000 is organized in Los Angeles by Rex B. Goodcell, to manufacture cream of tartar, tartaric acid, industrial alcohol and other grape by-products. First unit at Cucamonga, Cal., plans to use 300,000 tons of grapes during this season.

Contex Color Co. leases space in Paterson, N. J., and plans to engage in manufacture of dry and lake colors. Officers of the company are: president, Daniel Walker; vice-president, S. H. Salmon; secretary-treasurer, L. W. Sexton. Company is outgrowth of Cosmic Color Co., Newark.

Dyestuffs department, E. I. du Pont de Nemours & Co., Inc., announces three new colors, Ponsol Brown 4R Paste for Printing Lithosol Fast Yellow H20 per cent. Paste, and Sulfanthrene Blue 2BD Double Paste and 2BD Powder.

Amarillo helium plant, operated by Bureau of Mines, Department of Commerce, at Soncy, Tex., makes first shipment May 11, by specially constructed tank car of 200,000 cubic feet of helium.

European Dye Cartel Enlarged to Include Swiss Producers

The European dye cartel is enlarged to include Swiss producers by an agreement signed in Paris April 25, according to the Department of Commerce. The new agreement runs for three years from May 1, 1929, and is only slightly different in form from the Franco-German dyestuffs agreement signed in November, 1927. Germany has been allocated approximately 75 per cent. of the exports, France approximately 17 per cent. and Switzerland approximately eight per cent. Each country holds its home markets with certain reservations.

The quotas of the three nations in the individual countries importing dyestuffs have not been disclosed, but are thought to follow closely the general allocations. Established German organizations will continue to sell for the French in certain countries, particularly the Far East, while Switzerland will maintain or organize foreign sales bureaus to handle the sales of France and Germany in certain other countries, especially Italy, Spain, Czechoslovakia and Poland.

The agreement also includes a price accord, and exchange of technical information regarding dye production and dye utilization.

The adherents emphasize the importance of this agreement, particularly as it affects Asiatic markets, because of the growing American and English competition in India and China and the problem of increasing German sales in Japan because of the extension by the Japanese government of its subvention to the indigo industry and the unknown effect on this on the dye section of the German-Japanese commercial agreement.

The Swiss I. G. also issued the following announcement: "The following Swiss firms have hitherto had a community-of-interest arrangement: Gesellschaft fuer Chemische Industrie in Basel; Chemische Fabrik, formerly Sandoz; I. R. Geigy A. G.

"After lengthy negotiations those firms announce that they have come to an understanding with German, French, and other Swiss firms. This understanding relates to the sale of dyestuffs, regarding which some form of combination has been made inevitable by market conditions. The Swiss members of the combination are not to be in any way restricted in their constitution and operation. The capital of the companies and the profits of operation are not involved in the new arrangement. Nor is the American business of the above three companies brought under the agreement."

American Leather Chemists Hold Annual Meeting at Quebec

American Leather Chemists' Association holds twenty-sixth annual meeting at Chateau Frontenac, Quebec, June 5-7. The meeting opened with an address of the president, J. A. Wilson, on the morning of June 5. After the report of the secretary-treasurer, H. C. Reed, the remainder of the day was given over to various committee reports delivered by G. W. Priest, Dr. R. H. Matthews, M. C. Walsh, J. A. Wilson, Dr. H. B. Merrill, D. H. Cameron.

Sessions on the two remaining days were given over to a series of addresses and papers. Included among the authors were: F. F. Marshall, G. D. McLaughlin, J. H. Highberger, E. K. Moore, Joseph Daoust, R. C. Howard, G. E. Rockwell, W. L. Crist, F. M. Moffat, Dr. Harold Hibbert, Dr. G. Graesser, and Dr. Sun Tau. Golf, tennis, dancing and visits to nearby places of interests, featured the entertainment program.

Following the approval, by the Supreme Court of the Presidential "pocket vetoe", three bills for the disposal of Muscle Shoals are introduced into the Senate, May 27. One of them, the Norris Bill, authorizing government operation, which passed the Congress in 1928 and was subsequently "pocket vetoed", was favorably reported to the Senate, May 29, by the Agricultural Committee.

The Financial Markets

American Commercial Alcohol Corp. Places Common on $1.60 Annual Basis

Company also Declares 3 Per Cent Stock Dividend and Reports Net of $2.04 Per Share for First Quarter—Union Carbide Places New Common on $2.60 Annual Basis—Consolidated Chemical Industries Reports Net of $3.52 for First Quarter.

American Commercial Alcohol Corp. declares an initial quarterly dividend of 40 cents and an extra dividend of 3% in stock on the common stock, both payable July 15 to stock of record June 20. This places stock on $1.60 regular annual dividend basis. The 3% stock dividend, company states, is an extra dividend applicable to the first half year. Company's policy will be to declare stock dividends as extras semi-annually as earnings and conditions in the industry warrant. Company also declared the regular quarterly dividend of $1.75 on preferred, payable August 1 to stock of record July 10.

Company in statement to New York Stock Exchange for quarter ended March 31, 1929, reports net profit of $245,883 after interest, depreciation, federal taxes etc., equivalent after dividend requirements on 7% preferred stock, to $2.04 a share on 107,956 average no-par shares of common stock outstanding during the quarter and to $1.62 a share on 135,877 common shares outstanding at end of the quarter.

Income account for quarter ended March 31, 1929, follows: Operating revenue $454,736; expenses, etc., $176,882; operating profit $277,854; other income $60,942; total income $338,796; depreciation $27,302; interest and amortization $46,569; federal taxes $19,042; net profit $245,883; preferred dividends $25,666; surplus $220,217.

Union Carbide Places New Common $2.60 Basis with 65 Cent Dividend

Union Carbide & Carbon Corp. declares a quarterly dividend of 65 cents, payable July 1 to stock of record May 31, placing the new stock which was recently split three-for-one on a $2.60 annual basis, equivalent to $7.80 on the old stock, which paid $6 annually.

Edward F. Whitney has been elected a director of Union Carbide & Carbon Corp., succeeding Myron T. Herrick, deceased. C. K. G. Billings has been elected chairman of the board. G. O. Knapp, who was formerly chairman of the board, becomes honorary chairman, a position formerly held by Mr. Herrick.

Consolidated Chemical Industries Nets $3.52 Share in First Quarter

Consolidated Chemical Industries, Inc., San Francisco, reports net profit for first quarter ending March 31st, 1929, of $210,070.08, with a final net profit, after deducting depreciation and income taxes, of $141,081.29, equivalent on an annual basis to $564,325.16, or $3.52 per share on the Class "A" stock outstanding, as compared with $2.86 per share for the year 1928. Company also declared regular quarterly dividend of 37½ cents per share.

Monsanto Chemical Works declares regular quarterly dividend of 62½ cents, payable July 1 to stock of record June 20.

Du Pont Declares Extra Dividend of 50 Cents Per Share on Common

E. I. du Pont de Nemours & Co. declares an extra dividend of 50 cents, payable July 3, and the regular quarterly dividend of $1 on the common, payable June 15, both to stock of record May 29, and the regular quarterly dividend of $1.50 on the debenture stock, payable July 25 to stock of record July 10.

Edmund Gillet, commercial director of Credit Lyonnais of France and the recognized leader of the silk industry in Lyons, has been elected a director, E. I. du Pont de Nemours & Co., representing important stockholdings resulting from the recent acquisition by du Pont of French holdings in du Pont Rayon Co. A. B. Echols, treasurer, E. I. du Pont de Nemours & Co., has been made a member of the finance committee.

Mathieson Alkali Goes on $2 Basis with 50 Cent Dividend

Mathieson Alkali Works declares an initial quarterly dividend of 50 cents on the common, payable, at the option of the shareholders in cash or in stock on the basis of one share for each 100 shares held.

This is the first dividend since the recent four-for-one split-up and is on the basis of $8 a share annually for the old common, which had been paying $6.

Regular quarterly dividend of $1.75 was declared on the preferred. Both dividends are payable July 1, to stock of record June 7.

B. O. & G. C. Wilson, Inc., Boston, for the year ended Dec. 31, 1928 reports: Assets: Real estate, $47,944; machinery, $12,682; furniture, fixtures and tools, $14,626; autos, trucks, etc., $1,236; merchandise, $28,046; accounts receivable, $12,582; cash, $3,882; securities, $7,297; patent rights, $250,000; miscellaneous supplies, $877; insurance prepaid, $390; profit and loss, $17,615; total assets, $392,177. Liabilities: Preferred stock, $249,450; common stock $104,863; mortgages, $24,000; 18,924 shares managers' stock no par value, $1; accounts payable, $6,118; reserve depreciation, $7,745; total liabilities, $392,177.

International Combustion Engineering Corp. stockholders at the annual meeting vote to increase authorized no-par common stock to 1,150,000 shares from 1,100,000 shares. Increase of authorized common capitalization by 50,000 shares is to make available stock for conversion of a similar amount of preferred stock which was offered to stockholders of record April 26 on the basis of one share at $100 to every 20 shares of common or preferred held.

United States Gypsum Co. declares regular quarterly dividends of 40 cents on common and $1.75 on preferred, both payable June 30 to stock of record June 15.

Casein Co. of America declares the usual semi-annual extra dividend of $1 on the common in addition to the regular quarterly dividend of $1.50, both payable May 15 to stock of record May 7.

Allied Chemical & Dye Corp. declares regular quarterly dividend of $1.75 on preferred, payable July 1, to stock of record June 11.

Commercial Solvents Corp. declares regular quarterly dividend of $2, payable July 1, to stock of record June 15.

Anglo-Chilean Nitrate Reports Deficit of $2,469,332 for 1928

Report of Anglo-Chilean Consolidated Nitrate Corp. and subsidiaries for year ended December 31, 1928, shows deficit of $2,469,332 after taxes, depreciation and interest, including interest on debenture stock and debenture bonds but before depletion, against deficit of $3,813,377 in 1927. After deducting $261,703 for depletion total deficit for 1928, was $2,731,035, comparing with $3,897,483 in previous year.

Consolidated income account for year 1928 compares as follows:

	1928	*1927*
Operating income	$3,301,761	$1,129,956
Other income	156,535	49,258
Total income	$3,458,206	$1,179,214
Interest, taxes, etc.	3,713,154	3,063,565
Depreciation	2,214,384	1,927,016
Deficit	$2,469,332	$3,813,377
Depletion	261,703	84,106
Deficit	$2,731,035	$3,897,483

I. G. Preliminary Report Shows Net Profit of 118,485,000 Marks

Preliminary report of I. G. Farbenindustrie for 1928 shows 12 per cent. dividend on the 8,000,000 marks of common shares of the company, same as in 1927. Net profits were 118,485,000 marks, compared with 100,812,000 marks during the previous year. Profits were calculated after deducting 71,777,000 marks for depreciation, taxes and interest, compared with deduction of 74,742,000 in 1927. After alloting 11,709,900 marks to reserves and 6,600,000 marks to social funds, there remained a balance of 1,036,000 marks, which added to previous balance made a total carried forward of 5,436,000 marks. Dividend proved a disappointment to the market, since an increase over 1927 was expected.

Newport Co. Reports First Quarter Net of $1.03 Per Share

Newport Co. and subsidiaries report for quarter ended March 31, 1929, net profit of $355,930 after interest, depreciation and federal taxes, equivalent after allowing for dividend requirements on 130,000 shares (par $50) of $3 Class A stock, to $1.03 a share earned on 251,250 shares of no par common stock.

Newport Co. declared regular quarterly dividend of 75 cents on the convertible A stock, payable June 1 to stock of record May 21.

Atlas Powder Co. reports for quarter ended March 31, 1929, net income of $523,089, after depreciation, federal taxes, etc., equivalent after dividend requirements on 6% preferred stock, to $1.48 a share on 261,438 no-par shares of common stock. This compares with $361,991, or 87 cents a share on the common in first quarter of 1928.

United Chemicals, Inc. declares an initial quarterly dividend of 75 cents a share on the $3 participating preferred stock, payable June 1 to stock of record May 15.

Virginia-Carolina Chemical Co. declares the regular quarterly dividend of $1.75 on the 7 per cent. prior preference stock, payable June 1 to stock of record May 17.

Mutuelle Solvay increases capital from 100,000,000 to 300,000,000 Begian francs for the purpose of developing relations with Belgian and foreign banking groups.

Tennessee Copper & Chemical Corp. declared the regular quarterly dividend of 25 cents, payable June 15 to stock of record May 31.

Westvaco Chlorine Statement Lists Assets at $6,414,696

Statement of Westvaco Chlorine Products Co. as of March 31, 1929, filed with New York Stock Exchange, shows total assets of $6,414,696 compared with $6,485,626 on December 31, 1928, and earned surplus of $823,795 against $900,306. Current assets were $1,671,342 and current liabilities, excluding federal tax reserve, $282,487, as compared with $1,500,784 and $192,052, respectively, on December 31, 1928.

Consolidated balance sheet of Westvaco Chlorine Products Co., as of March 31, 1929, compares as follows:

Assets	*Mar. 31, '29*	*Dec. 31, '28*
*Property, plant and equipment	$3,977,542	$3,995,739
Patents and processes	529,725	529,725
Cash	198,238	107,429
Call loans	300,000	200,000
Accounts receivable	299,013	388,679
Inventories	779,048	692,957
Marketable investments	95,042	111,720
Miscellaneous investments	2,000	2,000
Sinking fund	36,372	92,560
Deferred charges	197,716	364,817
Total	$6,414,696	$6,485,626
Liabilities		
Preferred stock	$2,194,600	$2,194,600
†Common stock	656,400	656,400
Funded debt	2,309,500	2,388,000
Accounts payable	108,408	20,61
Notes payable	125,000	125,000
Accrued expenses	9,388	8,036
Dividends payable	39,692	38,406
Federal tax reserve	125,583	115,352
Trust agreement	22,000	22,000
Deferred credits	330	16,916
Earned surplus	823,795	900,306
Total	$6,414,696	$6,485,626

*After depreciation. †Represented by 200,000 no-par shares.

Statement of Glidden Co. and subsidiaries for six months ended April 30, 1929, shows net profit of $1,292,013 after interest, depreciation, federal taxes, etc., equivalent after dividend requirements on 7% prior preferred stock, to $2.09 a share on 500,000 shares of no par common stock which was outstanding up to April 4 and $1.75 a share on 597,753 shares outstanding at end of the period. This compares with $707,540 or $1.14 a share or 400,000 common shares outstanding in corresponding period of previous fiscal year. Glidden Co. declared the usual extra dividend of 12½ cents on the common and the regular quarterly dividends of 37½ cents on common and $1.75 on 7% prior preference stock, all payable July 1 to stock of record June 18.

Northern Industrial Chemical Co., South Boston, Mass., reports for the year ended Dec. 31, 1928: Assets—Real estate, $18,151; machinery, $141,277; furniture, fixtures and tools, $6,078; merchandise, $71,625; notes receivable, $2,000; accounts receivable, $91,529; cash, $27,345; securities, $29,967; secret process, $26,700; prepaid expense, $15,163; total assets, $429,835. Liabilities—Common stock, $337,233; accounts payable, $16,584; notes payable, $10,000; reserves, $630.72; deferred items, $2,946; total liabilities, $429,835.

Net profits of Etablissements Kuhlmann, French manufacturers of chemical products, for year ended December 31 totalled 39,410,000 francs, against 34,012,000 francs in the previous year. Dividend of 16 per cent. was declared, same as in 1927.

Annual report of Agfa Ansco Corp., covering period from date of merger of Agfa with Ansco on March 19, 1928, to December 31, 1928, shows gross profit, including other income, of $1,006,536 and profit of $85,080 before depreciation.

International Agricultural Chemical Corp. declares the regular quarterly dividend of $1.75 on the prior preference, payable June 1 to stock of record May 15.

The Industry's Stocks

1929 May 31 High	1929 May 31 Low	1929 High	1929 Low	1928 High	1928 Low	Sales In May	Sales Since Jan. 1	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1928	Earnings $-per share-$ 1927
								NEW YORK STOCK EXCHANGE					
127⅞	122¾	133	95¼	99⅝	59	188,200	469,600	Air Reduction	No	683,873	$2.00	9 mo. 3.70	10.74
276	270¼	305¾	241	252¾	146	58,400	364,200	Allied Chem. & Dye	No	2,178,109	6.00		10.03
122½	121	125	120½			2,900	13,700	7% pfd	100	392,849	7%		62.59
10⅞	10½	23⅜	10⅛	26	15⅜	31,100	136,500	Am. Agricultural Chem.	100	333,221	...		1.59
41½	40⅜	73¼	40⅜	79⅞	55⅜	23,000	88,400	pfd	100	284,552	...		7.86
135⅛	129½	151⅛	107⅞	117½	70½	1,578,500	6,303,900	American Can	25	2,473,998	3.00		4.11
141	137	141½	140	147	136½	3,300	18,600	pfd	100	412,333	7%		31.66
54⅜	53⅛	81⅛	50	63¾	39	79,200	1,173,600	American Metal, Ltd.	No	595,114	*3.00	9 mo. 2.30	3.64
114⅜	114⅜	135	113⅜	117½	109	2,000	20,600	pfd	100	99,907	6%	9 mo. 18.92	50.27
97½	95⅜	124⅜	93½	293	169	335,500	2,008,100	American Smelt. & Refin.	100	609,980	4.00	6 mo. 10.61	19.64
130	130	138	130	142	131	4,800	18,200	pfd	100	500,000	7%	6 mo. 16.44	30.96
26	25¼	49¼	24¼	57	6⅜	47,500	449,700	Amer. Zinc & Lead	25	193,120	...		...
...	...	111½	95	117⅜	40	4,400	33,200	pfd	25	96,560	...		d2.72
105½	102⅞	140	99	120½	53½	2,280,900	14,569,500	Anaconda Copper Mining	50	3,302,817	6.00		3.37
33⅛	31	49½	29	112⅞	55½	31,700	264,900	Archer Dan. Mid.	No	213,712	4.00	7.34	5.77
115	112¾	115	114			880	2,100	pfd	100	43,000	7%	16.94	37.39
96	94	115	90	114	63	7,300	63,600	Atlas Powder Co.	No	261,438	4.00	6.30	5.75
101	101	106½	100	110½	102	560	2,630	pfd	100	90,000	6%	6 mo. 10.83	22.71
64⅜	62⅝	71⅛	53⅛	66½	50	1,241,600	3,401,300	Atlantic Refining	25	500,000	1.00	9 mo. 21.72	1.83
5⅞	4⅝	9⅛	4⅜	12½	4½	30,100	225,200	Butte Copper & Zinc	5	600,000	...		0.10
7	6½	12⅝	6½	16½	8⅝	17,700	105,300	Butte Superior Mng.	10	290,198	2.00	9 mo. 0.16	0.94
120	119	138	104½	122	65	55,800	151,400	By Product Coke	No	189,936	*5.00	9 mo. 5.78	5.68
1⅛	1⅛	4	1⅛	5⅜	1⅞	18,700	181,800	Calla Lead & Zinc	10	724,592	...	9 mo. ...	0.10
40½	38⅛	61⅞	36⅜	47⅜	20⅛	154,900	1,770,300	Calumet & Hecla	25	2,005,502	2.50	9 mo. 0.95	0.29
24½	24	28⅝	16½	119	61½	47,200	138,100	Certainteed Prod.	No	400,000	...	9 mo. ...	5.31
64	62½	81½	47⅛	63½	23½	1,900	6,100	7% pfd	100	62,904	7%	9 mo. 0.87	56.80
97	85¾	127½	71½	74⅞	37⅜	4,500	1,331,000	Chile Copper	25	4,415,497	3.00	6 mo. 1.96	2.51
145	141	167⅞	121½	134⅜	79	108,900	327,400	Columb Carbon	No	402,131	...	9 mo. 5.24	4.83
332	325	370	225½	250½	137½	44,400	254,300	Commercial Solvents	No	217,722	8.00	13.19	9.25
68⅝	66	80½	60	64½	53	195,300	1,664,300	Cont. Can	No	1,420,000	5.00		7.21
128	124½	124½	128	128	123	310	2,170	pfd	100	51,125	7%		86.82
88	86⅝	101⅞	82	94	64⅜	211,800	700,500	Corn Products	25	2,530,000	2.00	9 mo. 3.00	3.50
142½	141½	144⅜	141½	146⅜	138½	1,440	7,480	pfd	100	250,000	7%	9 mo. 35.63	42.40
46	42⅞	69½	42⅞	68⅜	34⅜	106,500	881,700	Davison Chem.	No	480,000	...		6.21
46	▼45	64¼	44½	61	40	13,600	101,600	Devoe & Rayn A	No	110,000	2.40	6 mo. †5.95	†5.03
115	115	115½	112	120	108	230	1,370	1st pfd	100	17,473	7%	6 mo. 34.71	53.23
115⅞	115⅛	119	115⅜	121½	114	5,900	24,400	Dupont deb	100	904,539	6%	9 mo. 57.79	57.03
160	156	198½	155¼	503	310	121,400	528,500	Dupont de Nemours	No	2,661,658	*14.75	20.89	15.45
172	171	194½	168	194½	163	20,800	106,300	Eastman Kodak	No	2,057,560	*8.00		9.61
128	127½	128	126	132½	123½	130	1,280	pfd	100	61,657	6%		326.68
217	217	310	215	230	120	1,000	6,200	Fed. Mining & Smelting	100	50,400	...		23.36
75	72½	▼84⅜	65½	89⅜	65	600,600	1,287,500	Fleischmann	No	4,500,000	*5.00	9 mo. 3.24	4.30
40⅞	39	54⅞	38	109½	43	51,700	433,200	Freeport Texas	No	729,844	4.00	4.49	5.12
80½	78½	84½	61	94⅞	141½	223,600	452,400	General Asphalt	100	206,887	...	6 mo. ...	4.74
123	120	128⅜	104½	150	132	12,700	29,700	pfd	100	68,742	5%	6 mo. d5.09	19.34
45⅞	43	50½	36⅞	37	20⅜	94,000	702,500	Glidden Com.	No	500,000	*2.00	3.37	2.88
103	102½	106⅜	101¼	105	95	700	4,300	prior pfd	100	69,167	7%	32.69	23.91
55⅜	53½	82	53⅛	143½	71	376,100	2,833,000	Gold Dust	No		2.50		8.97
62½	62⅛	79½	62⅜	84	64½	11,000	55,900	Household Prod.	No	575,000	*4.00	6 mo. 2.64	5.22
8½	8⅛	17⅛	8⅛	20⅞	13	17,200	79,000	Intern. Agri.	No	450,000			1.34
69	68½	88⅛	68⅛	85	48⅜	4,100	13,500	pfd	100	100,000	7%		13.03
46	44	72⅜	40½	46	41½	1,289,600	9,224,200	Intern. Nickel	No	1,673,384	3.00	9 mo. 4.72	3.30
46	43⅞	63	43⅞	60	47½	10,000	58,900	Int. Print Ink	No	256,022	2.50	6 mo. 2.58	4.98
70½	70	90	55½	69	49½	1,240	13,970	Intern. Salt	100	60,771	...	6 mo. 0.05	5.38
162	152½	242½	152½	202	96½	214,800	1,654,900	Johns-Mansville	No	750,000	3.00	9 mo. 4.94	4.78
77⅜	76	113⅞	71⅜	124½	63¾	42,800	302,400	Liquid Carbonic Corp.	No	125,000	4.00	7.05	5.90
38⅜	38½	46	37	57¾	45	8,000	27,500	Mac and Forbes	No	378,500	*3.50	9 mo. 2.34	3.62
46⅜	44½	55⅞	42⅛	190	117½	116,600	162,680	Mathieson Alk	No	147,207	6.00	9 mo. 9.54	10.93
124	123	125	120	130	115	1,280	2,490	pfd	100	24,750	7%	9 mo. 63.03	74.06
38⅛	37⅝	54½	30½	33	17⅜	103,700	1,217,300	Miami Copper	5	747,116	2.00		1.53
42½	41	55½	33	58½	29½	74,400	592,000	National Dist. Prod.	No	168,000	...		...
79½	76½	86½	67½	...	...	12,000	86,500	pfd. tem. ctfs	...	...	...		...
142	142	173	132	136	115	8,540	126,840	National Lead	100	309,831	5%		8.90
49⅜	48½	52⅞	43					Newport Co.	50	130,000			
50	49⅛	58	38	41½	22⅜	50,500	417,800	Penick & Ford	No	433,773	...	9 mo. 1.32	1.76
265	250	287½	208	217	157	5,800	74,500	Peoples Gas Chi	100	511,521	8%	9 mo. 8.98	10.81
29	27	43½	27			155,200	781,900	Royal Baking, new com	100	800,000	1.00	6 mo. 0.53	1.14
98½	...	103½	96			300	1,300	pfd	100	100,000	6%	6 mo. 7.26	15.11
70	65½	94	62	71½	37	291,200	1,864,100	St Joseph Lead	10	1,950,509	*3.00		2.06
57⅛	56½	62⅜	48	59⅜	37⅜	667,100	3,627,400	Standard Oil Co. of N. J.	25	24,419,219	*1.50		1.52
39⅞	38⅜	45⅜	38	45½	28⅜	421,000	3,422,000	Standard Oil Co. of N. Y.	25	17,118,931	1.60		0.67
17	16½	20⅞	16	19⅞	10½	177,300	687,700	Tenn. Cop. & Chem.	No	794,626	1.00		0.51
71⅜	70¼	85½	70¼	82½	62⅛	440,200	2,535,400	Texas Gulf Sulfur	No	2,540,000	4.00	5.72	4.76
81⅛	78	86	75¼	209	186½	189,700	1,548,800	Union Carbide	No	2,742,072	6.00	9 mo. 7.16	9.53
157⅜	155	173⅜	128	138	102½	120,300	735,100	U. S. Ind. Alc.	No	240,000	6.00	6 mo. 3.90	7.26
...	...	124½	127	125⅞	118⅜	30	860	pfd	100	60,000	7%	6 mo. 19.12	36.03
73	68	116½	68	111½	60	110,100	1,073,800	Vanadium Corp.	No	376,637	*4.00	6 mo. 2.57	4.97
11¼	10⅜	24⅜	9¾	20⅜	12	51,700	447,900	Virginia Car. com.	No	486,700	...	0.69	...
39⅜	37⅜	65⅜	36⅜	64½	44⅜	5,300	87,020	6% pfd	100	213,392	...	7.57	d5.41
87⅛	87⅛	97½	86½	99½	88½	900	7,600	7% pfd	100	125,000	7%	20.09	d1.70
								NEW YORK CURB					
10	10	23	6	31½	16½	1,200	8,500	Acetol Prod	No	60,000	2.40		8.69
35½	35½	43½	32	42⅜	33½	13,300	27,900	Agfa Ansco	No	300,000	...		
146¼	146¼	154	106½	197½	120	13,400	53,100	Aluminum Co. of America	No	1,472,625	...		3.28
...	...	108⅛	103½	110½	104	2,900	12,800	pfd	100	1,472,625	6%		9.28
...	...	...	...	87⅛	74	28,400	92,600	Amer. Com. Alc.	No	77,000	...	3 mo. 2.66	...
40	39½	62½	39½	65	30⅛	66,500	489,300	Amer. Cyan.	20	428,465	8%	†3.67	†2.92
29⅞	29½	40½	26½	28½	11⅛	5,300	124,400	Amer. Sol. & Chem. com	No	160,000	...	1.58	0.07
...	...	...	...	47⅛	25½	3,200	61,000	pfd	No	100,000	...	6.52	3.17
38⅜	38½	45½	33	54	26½	34,700	117,400	Anglo Chile Nitrate	No	1,756,750	...	6 mo.. ...	...
9½	9½	10½	4⅜	33⅜	7	18,600	81,200	Br. Celanese	No	2,650,000	...	0.55	...
29	28			46½	41			Canad. Ind. Alc.	No	1,092,915	1.52	†2.87	†2.49
...	...	267	180	226	156	160	4,150	Casein Co.	100	21,196	*9%		7.98
38½	38⅜	57½	38⅜	103	36½	18,200	86,900	Celanese Corp. of Am	No	1,000,000	...		1.72
39	35	...	...	122	34	100	4,200	Celluloid Co.	No	194,952	...		0.87
...	...	...	...	132	103¾	100	2,100	1st pfd	No	23,882	7.00		11.94
				97½	75			7% pfd	No	24,551	7.00		9.96
[67⅛	[66	80⅛	63	92	75	10,900	38,200	Colgate-Palmolive Peet			2.00		
				...	...			Courtaulds	£1	12,000,000	22½%		26.55%
...	...	25½	18⅛	24⅞	20	4,200	31,400	Am. dep-rects	...	...	...		...

1929 May 31 High	1929 May 31 Low	1929 High	1929 Low	1928 High	1928 Low	Sales In May	Sales Since Jan. 1	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1928	Earnings $-per share-$ 1927
...	...	130	96¾	380	192	230	2,370	Hercules Powder	No	147,000	14%	22.04	16.35
117½	117½	121¾	115	125	118½	370	1,110	pfd	100	114,241	7%	9 mo. 24.69	28.02
...	...	37	19½	23	7½	4,100	11,800	Heyden Chem.	10	150,000	...		1.0
19½	19½	27	16¼	98	38½	100	1,500	Monroe Chem.					
...	...	...	...	...	...	550	950	Monsanto Chem.	No	110,000	2.50	9 mo. 6.30	6.11
				...	...			Penn Salt	50	150,000	5.00	8.27	8.09
...	...	9½	7	9⅜	6½	2,600	28,400	Pyrene Mfg.	10	219,470	.80		0.70
...	...	105⅜	81	...	...	3,145	5,005	Sherwin Williams	20	594,445	4.00	6.99	6.42
38½	37½	48½	23½	111½	103	46,000	413,900	Silica Gel	No	600,000	...		
5¼	5¼	5⅛	4⅛	92	65½			Snia Viscosa	120 lire	8,333,333	...		3 01 lire
				29	17			dep-recpts.	...	...	...		...
				9¼	6½			Spencer Kellogg	No	500,000	1.60	3.59	2.37
...	...	139½	127	10	5⅛	3,000	20,300	Swift & Co.	100	1,500,000	8%	9.87	8.13
...	...	595	351	42	31½	3,320	12,305	Tubize "B"	No	78,858	10.00		
40	39	61½	39	150½	125	26,200	51,100	United Chem., pfd.	50	120,000	3.00		
97	97	115	97	630	450	1,300	187,600	com.	No	102,000			
74⅞	72½	75½	56	100	53¾	45,100	212,000	U. S. Gypsum	20	691,502	1.60	6 mo. 4.42	10.08
...	...	...	...	...	...	4,800	21,500	Westvaco Chlorine Prod.	No	200,000	2.00	3.60	
								CLEVELAND					
205	200	275	135	147½	104	3,666	6,965	Cleve-Cliff Iron	No	400,000	4.00		9.74
...	...	...	...	225	112½	93	691	Dow Chem.	No	120,000	6.00		
...	...	...	...	107	103¾	62	261	pfd	100	30,000	7%		
				...	...			Glidden	No	500,000	*2.00	3.37	2.88
...	...	...	...	104¾	96	20	1,426	prior pfd	100	69,167	7%	32.69	23.91
90	90	105	82	95	65½	6,943	12,086	Sherwin Williams	25	594,445	4.00	6.99	6.42
105	105	108	104½	109½	106	631	3,141	pfd	100	125,000	6%	39.21	37.82
...	...	29	25	28	24¾	53	1,598	Wood Chemical Prod. "A"	No	20,000	2.00		7.75
								CHICAGO					
...	...	51	36	96	91½	750	17,705	Monroe Chem.	100	167,500	...		4.74
148	148	160	104	146	127½	13,700	38,027	Monsanto Chem.	No	110,000	2.50	9 mo. 6.30	6.11
128	127	140	127	...	..	6,350	27,970	Swift & Co.	100	1,500,000	8%	9.87	8.13
74¼	74¼	75	45¾	...	...	117,850	146,650	U. S. Gypsum	20	691,502	1.60	6 mo. 4.42	10.08
...	...	60⅞	40	100	55	2,950	53,350	United Chemicals, pfd.	50	120,000	3.00		
								CINCINNATI					
...	...	...	...	...	...	15	119	Fleishmann pfd	100	12,200	6%	9 mo. 1,197.09	1,589.49
365	364½	390	279	300	249	3,753	20,944	Proc. & Gam.	20	1,250,000	8.00	11.96	11.38
								PHILADELPHIA					
...	...	97½	90	109½	92	700	6,100	Penn. Salt	50	150,000	5.00	8.27	8.09
198¼	190¼	200⅝	157	173½	114¼	453,900	1,499,085	United Gas Imp.	50	3,903,791	6.00		6.28
								MONTREAL					
11	11			...	...	1,629	30,228	Asbestos Corp.	No	200,000	...		0.87
...	...	...	...	...	...	615	7,665	pfd.	100	74,564	7%		9.32
29⅞	28⅞	...	...	..	...	22,023	141,531	Canada Ind. Ale	No	1,092,915	1.52	†2.87	†2.49
73	71	...	...	...	...	29,852	235,391	Shawinigan W. & P.	No	1,844,700	2.00		2.41
								BALTIMORE					
...	...	...	...	28¼	17	20	5,107	Silica Gel	No	600,000	...		
Bid	**Asked**							UNLISTED					
119	114		...	80	70			Agfa Ansco, pfd.	100	50,500	...		...
75	71	...	...	375	190			Hercules Powd., com.	No	147,000	14%	9 mo. 15.10	16.36
				82	64			Merck. & Co., pfd.	100	33,950	...		...
				169	116			Newport	1	929,498	...		0.19

*Includes extra dividends. †Class A and class B shares combined. d Deficit.

The Industry's Bonds

1929 May 31 High	1929 May 31 Low	1929 High	1929 Low	1928 High	1928 Low	Sales In May	Sales Since Jan. 1	ISSUE	Date Due	Int. %	Int. Period	Orig. (1) Offering $
								NEW YORK STOCK EXCHANGE				
104⅛	104⅛	106⅛	103⅛	106⅛	104	123	522	Am. Agri Chem.	1941	7½	F. A.	30,000
94½	94½	96½	93½	97	92	134	719	Amer. Cyanid	1942	5	A. O.	
99⅞	99¼	102	99½	102⅜	99⅜	343	1,405	Am. Smelt & Refin "A" 5%	1947	5	A. O.	...
97	95	100	94½	105½	92	168	1,751	Anglo Chilean	1945	7	M. N.	16,500
100¼	100¼	102½	100	103⅜	99⅞	155	543	Atlantic Refin.	1937	5	J. J.	15,000
100	100	102	100	103⅛	100	26	137	By product Coke	1945	5½	M. N.	8,000
103	100⅜	99½	103	103⅛	100	20	36	Corn Product Refin.	1934	5	M. N.	10,000
105	105	109½	103	117	106	41	312	General Asphalt	1939	6	A. O.	5,000
92	91	95	90½	95⅜	89¼	77	109	Int. Agric. Corp.	1932	5	M. N.	30,000
80	78	81½	76⅜	86½	77	26	64	Int. Agri. Corp. stamped. extended	1942	5	M. N.	7,020
109	109	127	109	...	...	84	1,158	Montecatini	1937	7	J. J.	
96	96	96¾	93	...	...	231	1,264	Ex War.	1937	7	J. J.	
112	110	113	111½	...	...	18	57	People's Gas & Coke	1943	6	A. O.	10,000
101	101	105⅜	101	108½	102	56	286	Refunding	1947	5	M. S.	40,000
100½	100½	103⅜	100½	104	102	457	2,191	Standard Oil N. J.	1946	5	F. A.	120,000
106¼	105½	115	102	120	101½	195	530	Tenn. Cop. and Chem.	1941	6	A. O.	3,000
71	69	82	70	91⅞	82	36	90	Va. Iron C. & C.	1949	5	M. S.	
								NEW YORK CURB				
100½	100	102½	100	103½	100	307	1,505	Alum. Co. of Am 52	1952	5	M. S.	
				121½	98			Amer. Com. Alc.	1943	5	M. N.	
...	...	122	108¾	125	99	29	1,345	Amer. Solv. & Chem.	1936	6	M. S.	
96¾	96	100½	95⅝	101¾	97½	173	1,474	Koppers Gas and Coke	1947	5	J. D.	25,000
...	...	101	98½	103½	98	29	166	Natl. Dist. Prod.	1935	6½	J. D. 15	3,500
...	...	94¾	90½	98¾	93⅛	274	868	Shawinigan W & P	1967	4½	A. O.	
105	105	112½	101	106⅜	100	55	218	Silica Gel. 6½% with warr.	1952	6½		
...	...	98⅜	94½	100	95	38	216	Solvay Am. Invest. Corp.	1942	5	M. S.	15,000
99⅛	99½	100¼	98⅜	101½	99⅜	314	1,379	Swift & Co.	1932	5	A. O.	50,000
101	101	104	99½	104	99½	49	282	Westvaco Chlorine Prod.	1937	5½	M. S.	2,500

United States Furnishes 92 Per Cent of Germany's 1928 Sulfur Imports

Germany's total exports of sulfur in 1927 (48,166 metric tons) were equal to 51 per cent. of the quantity imported (93,557 tons); in 1928 exports increased to the equivalent of 63 per cent. of the sulfur imports, reports the Department of Commerce. Over 92 per cent. of the 1928 sulfur imports came from the United States and about seven per cent. from Italy. These figures are taken from the German annual statistical record and show German sulfur imports from the United States as about half the quantities in "Foreign Commerce and Navigation of the United States." The United States export records for 1928 show 125,660 long tons of sulfur to Germany as compared to Germany's record of sulfur imports from the United States (96,854 metric tons). This apparent divergence is due to the fact that German ports are utilized in the trade as transfer points for much of the sulfur destined to other European countries. Cargoes of sulfur consigned to German ports may be sold by radio and redirected before arrival or may arrive and be transferred in small lots to a number of smaller vessels capable of movement into ports inaccessible to the original vessel. Yet they must be recorded as exports to Germany. Included in the 1928 sulfur exports from Germany were Sweden (21,036 metric tons), Finland (22,165), Portugal (967), Russia (2,020), British India (1,874), Great Britain (2,594), and Danzig (934).

Ministry of Commerce and Industry, Japan, decides to investigate a report submitted to it by the Japanese Dyestuff Manufacturing Co., alleging dumping of direct black dyes in the Japanese market by the National Aniline Co. Direct Deep Black E double conc. of the American company is said by the report to have been sold in large quantities at extremely low prices.

The Trend of Prices

High Rate of Production Continues Throughout Most Industrial Groups

First Four Months Set New Record for Industrial and Commercial Activity—Volume of Chemical Sales Continued at High Level During May—Markets Generally Are Firm and Characterized by Excellent Demand—Fertilizers Off.

Preliminary reports for the first half of May indicated a continued high rate of operation in the iron and steel industry, while the output of lumber and bituminous coal was somewhat larger than at the end of April, according to the Federal Reserve Board.

The board said that the iron and steel and automobile industries continued exceptionally active during April and that activity in copper refining, lumber, cement, silk and wool textiles, and the meat-packing industry increased.

Production of cotton textiles showed a less than seasonal reduction. Output of mines was also larger in April than in March, with copper and anthracite coal production increasing and a smaller decline than usual in the output of bituminous coal. Petroleum production declined slightly.

Discussing bank credit, the board said that during the four weeks ended May 15, loans and investments of member banks in leading cities showed a decrease of nearly $200,000,000, largely in loans on securities, together with some further decline in investments. All other loans, chiefly for commercial and agricultural purposes, remained unchanged at a relatively high level.

There was a further reduction in the average volume of Reserve Bank credit outstanding between the weeks ended April 24 and May 22, owing largely to additions to the country's monetary stock of gold. The decline was in discounts for member banks; holdings of acceptances and of United States securities showed practically no change.

Open-market rates for commercial paper remained unchanged as did rates on prime bankers' acceptances, except for a temporary decline at the end of April and the first week in May. Rates on collateral loans advanced in the first three weeks in May.

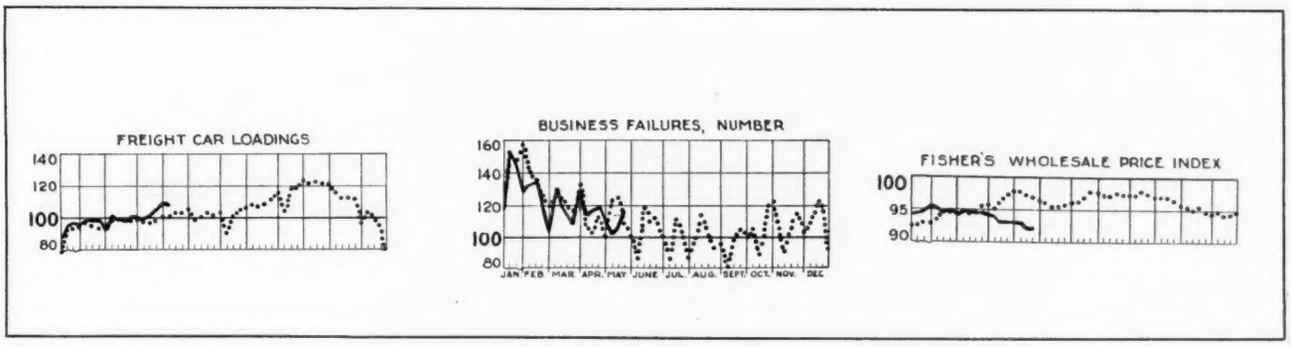
Shipments of commodities by rail increased during April and were the largest for this month in any recent year, the board said. The increase from March reflected larger loadings of miscellaneous freight, lumber, live stock and ore. During the first half of May shipments of freight continued to increase.

Wholesale commodity prices averaged slightly lower in April than in March, reflecting primarily declines in prices of farm products and their manufactures.

The first four months of 1929 showed greater industrial and commercial activity than has ever before been registered in any like period, practically all the records of production, trade, and finance showing decided increases over the first four months of 1928, while most of them reached record totals, according to the Secretary of Commerce, Robert P. Lamont.

That industry generally is in very healthy condition is further attested by conditions within the chemical industry. No better indication of the state of business is offered than that furnished by soda ash which, going as it does, into every branch of business, points to the activity of that branch. The soda ash market is in excellent shape, probably better than it has ever been in the past ten years. The volume far exceeds that of even the most favorable forecasts. Soda caustic is also in very firm position, being exceeded only by that of ash. In some sections there is reported to be a condition approaching shortage and even curtailment of textile operations in the South failed to affect the position of the market. On the West Coast only, are these alkalis in any but the most favorable position, and that is not due to any lack of demand, but rather to local production conditions which temporarily are having an unstable affect upon the market there.

Demand for sulfuric acid has fallen off somewhat from the peak set earlier in the year, but the market for it and the other mineral acids continues firm. The wood chemical group are all firm, with calcium acetate especially in rather tight position due to continued heavy demands from acetic acid producers. Phenol continues to be scarce on spot, while the situation in formaldehyde has eased off a bit. Alcohol business has come in in satisfactory volume, although in some quarters it is reported that the volume was not up to that of last year. The fertilizer group has hit a slump, while trading in oils and fats has been only spasmodic in nature during the past month.



Business indicators prepared by the Department of Commerce. The weekly average 1923-1925 inclusive = 100. The solid line represents 1929 and the dotted line 1928.

Prices Current

Heavy Chemicals, Coaltar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Naval Stores, Fatty Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Imported chemicals are so designated. Resale stocks when a market factor are quoted in addition to makers' prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - May 1929 $1.04

Acetone — Has been in steady routine demand during the past month with prices firmly maintained in all directions. The curtailment of rayon producing activities in the South due to labor difficulties has had apparently no effect upon the general tone of the market. Oil refiners continue to call for this material in increasing amounts.

Acid Acetic — Continues to move as fast as produced. Even the slackening of rayon production in the South due to labor troubles, had apparently no tendency whatsoever to permit of any accumulation of stocks. With supplies of acetate of lime in rather limited quantities, there seems to be no other indication than one of continued tightness, with supplies of the acid at a premium. Exports of acetic acid from the United States during 1928 amounted to 297,333 pounds, valued at $41,894, according to the Department of Commerce. These exports were divided as follows: Canada, 35,603 pounds, valued at $7,360; Cuba, 86,804 pounds, valued at $10,184; United Kingdom, 240 pounds, valued at $106; Honduras, 9,007 pounds, valued at $692; Venezuela, 28,672 pounds, valued at $3,936; Dominican Republic, 3,789 pounds, valued at $744; Japan, 130 pounds, valued at $34; and other countries, 133,089 pounds, valued at $18,808. Imports into this country from the Province of Quebec during 1928 more than doubled in value as compared with 1927. They amounted to 18,616,593 pounds, valued at $1,787,393; as compared with 10,595,164 pounds, valued at $839,178 in 1927.

Acid Citric — The constant upward trend to the raw material market has placed this acid in very strong position, but there has been no indication that domestic manufacturers will increase prices. Reports from abroad indicate a constant strengthening there and a cable received from the consulates at Palermo and Messina states that new production of citrate of lime barely reached 4,000 metric tons, about 300 metric tons less than last year. During the season from December 1, 1928, to the end of March, 1929, 7,021 metric tons of citrate of lime were sold of which more than 4,300 metric tons were sold between December 1 and

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.26	.18½	.24	.24	Acetaldehyde, drs 1c-1 wks...lb.	.18½	.21	.21	.18½
				Acetaldol, 50 gal dr.....lb.	.27	.31	.31	.27
.24	.23	.20	.20	Acetanilid, tech, 150 lb bbl...lb.	.23	.24	.24	.23
.35	.29	.29	.29	Acetic Anhydride, 92-95%, 100 lb cbys.....lb.	.29	.35	.35	.29
.....	.....	.38	.32	Acetin, tech drums.....lb.	.30	.32	.32	.30
.15	.13	.....	.....	Acetone, CP, 700 lb drums c-1				
.15	.13	.12	.12	wks.....lb.	.....	.15	.15	.15
1.75	1.65	1.65	1.65	Acetone Oil bbls NY.....gal.	1.15	1.25	1.25	1.15
.45	.42	.42	.42	Acetyl Chloride, 100 lb cby...lb.	.55	.68	.68	.45
				Acetylene Tetrachloride (see tetrachlorethane).....				
				Acids				
				Acid Acetic, 28% 400 lb bbls				
3.88	3.38	3.38	3.38	c-1 wks.....100 lb.	.....	3.88	3.88	3.88
13.68	11.92	11.92	11.92	Glacial, bbl c-1 wk.....100 lb.	.....	13.68	13.68	13.68
1.00	.98	.98	.98	Anthranilic, refd, bbls.....lb.	.98	1.00	1.00	.98
.80	.80	.80	.80	Technical, bbls.....lb.	.....	.80	.80	.80
2.25	1.60	1.60	1.25	Battery, cbys.....100 lb.	1.60	2.25	2.25	1.60
.60	.57	.57	.57	Benzoic, tech, 100 lb bbls....lb.	.57	.60	.60	.57
.11	.08½	.08½	.08½	Boric, crys. powd, 250 lb. bbls.....lb.	.05¾	.06½	.06½	.05¾
1.25	1.25	1.25	1.25	Broenner's, bbls.....lb.	.....	1.25	1.25	1.25
.90	.85	.85	.80	Butyric, 100% basis cbys.....lb	.85	.90	.90	.85
4.85	4.85	4.90	4.85	Camphoric.....lb.	.....	4.85	4.85	4.85
.28	.13	.25	.25	Carbolic, 10%, 50 gal bbls....lb.	.13	.14	.14	.13
.16	.15	.15	.15	Chlorosulfonic, 1500 lb drums wks.....lb.	.04½	.05½	.05½	.04½
.30	.25	.37	.25	Chromic, 99%, drs extra.....lb.	.19	.21	.23	.19
1.06	1.00	1.00	1.00	Chromotropic, 300 lb bbls....lb.	1.00	1.06	1.06	1.00
.44½	.59	.44½	.43	Citric, USP, crystals, 230 lb. bbls.....lb.	.46	.59		.46
.97	.95	.95	.95	Cleve's, 250 lb bbls.....lb.	.52	.54	.59	.52
.70	.68	.60	.57	Cresylic, 95%, dark drs NY..gal.	.60	.70	.54	.60
.72	.72	.70	.60	97-99%, pale drs NY.....gal.	.72	.77	.77	.72
.12	.11	.11	.10	Formic, tech 90%, 140 lb. cby.....lb.	.10½	.11½	.11½	.10½
.55	.50	.50	.50	Gallic, tech, bbls.....lb.	.50	.55	.12	.50
.74	.74	.74	.69	USP, bbls.....lb.	.....	.74	.55	.74
1.06	1.00	1.00	1.00	Gamma, 225 lb bbls wks.....lb.	.80	.85	.74	.74
.63	.57	.57	.57	H, 225 lb bbls wks.....lb.	.68	.72	.99	.80
.67	.67	.67	.65	Hydriodic, USP, 10% soln cby lb.	.....	.67	.72	.67
.48	.45	.45	.45	Hydrobromic, 48%, coml, 155 lb cbys wks.....lb.	.45	.48	.67 .48	.45
				Hydrochloric, CP, see Acid Muriatic.....			.....	.....
.90	.80	.80	.80	Hydrocyanic, cylinders wks...lb.	.80	.90	.90	.80
06	.06	.06	.06	Hydrofluoric, 30%, 400 lb bbls wks.....lb.	.....	.06	.06	.06
.11	.11	.11	.11	Hydrofluosilicic, 35%, 400 lb bbls wks.....lb.	.....	.11	.11	.11
.85	.85	.85	.85	Hypophosphorous, 30%, USP, demijohns.....lb.	.....	.85	.85	.85
.06	.04¾	.05½	.05½	Lactic, 22%, dark, 500 lb bbls lb.	.04½	.05	.05½	.04½
.13½	.12	.13	.13	44%, light, 500 lb bbls.....lb.	.11	.11½	.12½	.11
.54	.52	.52	.52	Laurent's, 250 lb bbls.....lb.	.40	.42	.42	.40
.60	.48	.....	.....	Malic, powd., kegs.....lb.	.48	.60	.60	.48
.65	.60	.60	.60	Metanilic, 250 lb bbls.....lb.	.60	.65	.65	.60
.08	.07¼	.07¼	.07¼	Mixed Sulfuric-Nitric..... tanks wks.....N unit	.07	.07¼	.07¼	.07
.01½	.01	.01	.01	tanks wks.....S unit	.008	.01	.01	.008
.21	.18	.21	.18	Monochloroacetic, tech bbl..lb.	.18	.21	.21	.18
.65	.65	1.65	1.65	Monosulfonic, bbls.....lb.	1.65	1.70	1.70	1.65
1.40	1.35	1.35	1.35	Muriatic, 18 deg, 120 lb cbys c-1 wks.....100 lb.	.....	1.35	1.40	1.35
				tanks, wks. 100 lb.		1.00	1.00	1.00
1.80	1.70	1.70	1.70	20 degrees, cbys wks...100 lb.	.....	1.45	.....	1.45
.95	.85	.95	.95	N & W, 250 lb bbls.....	.85	.95	.95	.85
.59	.55	.55	.55	Naphthionic, tech, 250 lb.....	.....	Nom.	.59	.55
5.00	5.00	5.00	5.00	Nitric, 36 deg, 135 lb cbys c-wks.....100 lb.	.....	5.00	5.00	5.00
6.00	6.00	6.00	6.00	40 deg, 135 lb cbys, c-1 wks.....100 lb.	.....	6.00	6.00	6.00
.11½	.10¾	.11½	.11	Oxalic, 300 lb bbls wks NY...lb.	.11	.11½	.11½	.11
.08½	.08	.08	.07	Phosphoric 50%, 150 lb cby..lb.	.08	.08½	.08½	.08
.16	.16	.19	16	Syrupy, USP, 70 lb drs....lb.	.....	.16	.16	.16
.50	.50	.50	.50	Picramic, 300 lb bbls.....lb.	.65	.70	.70	.65
.50	.40	.45	.30	Picric, kegs.....lb.	.40	.50	.50	.40
.86	.86	.86	.86	Pyrogalic, technical, 200 lb bbls.....lb.	.....	.86	.86	.86
.32	.27	.27	.27	Salicylic, tech, 125 lb bbl.....lb.	.37	.42	.42	.37
.16	.15	.15	.15	Sulfanilic, 250 lb bbls.....lb.	.15	.16	.16	.15
1.95	1.60	1.60	1.60	Sulfuric, 66 deg, 180 lb cbys 1c-1 wks.....100 lb.	1.60	1.95	1.95	1.60
				tanks, wks. ton		15.50	15.50	15.50
1.37½	1.20	1.20	1.20	1500 lb dr wks.....100 lb.	1.50	1.65	1.65	1.50
1.12½	1.12½	1.10	1.10	60°, 1500 lb dr wks....100 lb.	1.27½	1.42½	1.42½	1.27½
1.52½	1.52½	1.50	1.50	Oleum, 20%, 1500 lb. drs 1c-1 wks ....100 lb.	.....	1.52½	1.52½	1.52½

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - May 1929 $1.04

February 3 at 600 lire and the rest from February 4 to the end of March at 650 lire per quintal (value of lira—$0.0523 United States currency). Sales were based upon 65 per cent. acid content.

Acid Chromic — Lack of any steady demand coupled with abundant stocks of this material has resulted in some price shading and a final lowering in price to a basis of 19c @ 21c lb. during the past month.

Acid Formic — Lack of demand from tanning and textile plants lead to a reduction on the 90 per cent. grade to 10½c @ 11½c lb. during the past month.

Acid Sulfuric — Demand still continues very good but not quite up to that which had prevailed during the first quarter of the year and it can be safely said that the peak has definitely been passed.

Acid Tartaric — Demand has been constantly improving during the past month and this market is now in strong position due to prevailing high prices of raw materials. The market position has also been materially strengthened by tariff activities.

Acid Tungstic — A definite raw material shortage has lead to greatly increased prices in this material which is now quoted at $1.79 @ $2.10 lb. Over half of the world's tungstic comes from China and between internal difficulties in that country and a revival of demand for tungstic as a cutting agent, there has resulted a world shortage of the material. Higher raw material prices have occasioned a consequent rise in the price of the acid.

Albumen — Demand continues in routine condition although quotations on edible egg have declined to 77c @ 88c lb. since last quoted. Technical remains unchanged.

Alcohol — The past month has witnessed quite a bit of activity following the announcement of prices reported here last month. It is reported that business has been in satisfactory volume but not quite up to that which was done last year during the same period. However, the market is very firm, and in very satisfactory position at all points.

Production of ethyl alcohol declined slightly during April according to a statistical summary by the Industrial Alcohol Institute. The output of ethyl totaled 7,049,009 wine gallons, as compared with 7,154,439 gallons during March and with 5,639,492 gallons produced during the same month last year. The decline in the April production from the previous month was 105,430 gallons, or one per cent. Compared with the same month in 1928, however, the April output shows an increase of 1,409,517 gallons, or 24½ per

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
42.00	42.00	42.00	42.00	40%, 1c-1 wks net ton	.....	42.00	42.00	42.00
.40	.30	.30	.30	Tannic, tech, 300 lb bbls lb.	.30	.40	.40	.30
.38	.34½	.37	.29½	Tartaric, USP, crys, powd, 300 lb. bbls lb.	.38	.38½	.38½	.38
.85	.85	.85	.85	Tobias, 250 lb bbls lb.	.....	.85	.85	.85
2.75	2.75	2.75	2.00	Trichloroacetic bottles lb.	.....	2.75	2.75	2.75
2.00	2.00	2.00	2.00	Kegs lb.	.....	2.00	2.00	2.00
1.25	1.00	1.00	1.00	Tungstic, bbls lb.	1.79	2.10	2.10	1.00
.55	.43	.45	.45	Albumen, blood, 225 lb bbls lb.	.43	.47	.47	.43
.84	.78	.95	.80	Egg, edible lb.	.77	.80	.83	.70
.80	.70	.92	.77	Technical, 200 lb cases lb.	.70	.75	.80	.70
.65	.60	.60	.60	Vegetable, edible lb.	.60	65	.65	.60
.55	.50	.50	.50	Technical lb.	.50	.55	.55	.50
				Alcohol				
.20	.18½	.20	.19	Alcohol Butyl, Normal, 50 gal drs c-1 wks lb.	.....	.1775	.17½	.17½
.19½	.18½	.20½	.19½	Drums, 1-c-1 wks lb.	.....	.1825	.18½	.18½
.19	.17½	.19½	.18½	Tank cars wks lb.	.....	.1725	.17½	.17½
2.25	1.75	.....	.....	Amyl (from pentane) drs c-1 wks gal.	.....	1.67	1.67	1.67
1.80	1.70	1.70	1.70	Diacetone, 50 gal drs del gal.	1.70	1.80	1.80	1.70
3.70	2.65	3.70	3.70	Ethyl, USP, 190 pf, 50 gal bbls gal.	.....	2.69½	2.69½	2.69½
.55	.50	.50	.50	Anhydrous, drums gal.	.....	.71	.71	.71
.52	.48½	.52	.37½	Completely denatured, No. 1, 190 pf, 50 gal drs drums extra gal.	.....	.51	.51	.49
.50	.43	.50	.29	No. 5, 188 pf, 50 gal drs. drums extra gal.	.....	.50	.50	.48
.46	.41	.46	.25	Tank, cars gal.	.....	.48	.48	.46
1.25	1.00	1.00	1.00	Isopropyl, ref, gal drs gal.	1.00	1.25	1.25	1.00
1.00	1.00	1.00	1.00	Propyl Normal, 50 gal dr. gal.	.....	1.00	1.00	1.00
.82	.80	.80	.80	Aldehyde Ammonia, 100 gal dr lb.	.80	.82	.82	.80
.65	.65	.65	.65	Alpha-Naphthol, crude, 300 lb bbls lb.	.....	.65	.65	.65
.37	.35	.35	.35	Alpha-Naphthylamine, 350 lb bbls lb.	.32	.34	.34	.32
3.30	3.25	3.25	3.15	Alum Ammonia, lump, 400 lb bbls, 1c-1 wks 100 lb.	3.25	3.30	3.30	3.25
5.50	5.25	5.25	5.25	Chrome, 500 lb casks, wks 100 lb.	5.25	5.50	5.50	5.25
3.20	3.10	3.50	3.10	Potash, lump, 400 lb casks wks 100 lb.	3.00	3.10	3.20	3.00
5.50	5.25	5.25	5.25	Chrome, 500 lb casks wks 100 lb.	5.25	5.50	5.50	5.25
3.75	3.75	3.75	3.75	Soda, ground, 400 lb bbls wks 100 lb.	.....	3.75	3.75	3.75
26.00	24.30	27.00	26.00	Aluminum Metal, c-1 NY 100 lb.	.....	24.30	24.30	24.30
.40	.35	.35	.35	Chloride Anhydrous, 275 lb drums lb.	.35	.40	.40	.35
.18	.17	.17	.17	Hydrate, 96%, light, 90 lb bbls lb.	.17	.18	.18	.17
.24	.18	.23	.23	Stearate, 100 lb bbls lb.	.25	.26	.26	.25
1.75	1.75	1.75	1.75	Sulfate, Iron, free, bags c-1 wks 100 lb.	1.95	2.05	2.05	1.95
1.40	1.40	1.40	1.35	Coml, bags c-1 wks 100 lb.	.....	1.40	1.40	1.40
1.15	1.15	1.15	1.15	Aminoazobenzene, 110 lb kegs lb.	.....	1.15	1.15	1.15
				Ammonium				
.14	.13½	.13½	.10	Ammonia, anhyd, 100 lb cyl lb.	.14	.14	.14	.14
.03	.03	.03	.02½	Water, 26°, 800 lb dr del lb.	.....	.03½	.03½	.03½
.22	.21	.21	.21	Bicarbonate, bbls., f.o.b. plant 100 lb.	.....	5.15	6.50	5.15
.09	.08½	.08½	.08½	Bifluoride, 300 lb bbls lb.	.21	.22	.22	.21
5.15	4.45	5.05	4.85	Carbonate, tech, 500 lb cs. lb.	.09	.12	.12	.09
5.75	5.25	.07	.05½	Chloride, white, 100 lb. bbls wks 100 lb.	4.45	5.15	5.15	4.45
.11½	.11	.11	.11	Gray, 250 lb bbls wks lb.	5.25	5.75	5.75	5.25
.16	.15	.15	.15	Lump, 500 lb cks spot lb.	.11	.11½	.11½	.11
.10	.06	.06	.06	Lactate, 500 lb bbls lb.	.15	.16	.16	.15
.38	.27½	.27½	.27½	Nitrate, tech, casks lb.	.06	.10	.10	.06
.18	.18	.18	.18	Persulfate, 112 lb kegs lb.	.31	.34	.34	.31
2.90	2.20	2.30	2.55	Phosphate, tech, powd, 325 lb bbls lb.	.12½	.13	.13	.12½
3.00	2.50	2.55	2.35	Sulfate, bulk c-1 100 lb.	.....	2.25	2.40	2.30
60.85	60.85	59.70	56.85	Southern points 100 lb.	.....	2.30	2.45	2.30
.60	.55	.55	.55	Nitrate, 26% nitrogen 31.6% ammonia imported bags ton	.....	60.85	60.85	60.85
2.25	1.72	2.25	1.90	Sulfocyanide, kegs lb.	.36	.48	.48	.36
.....	.....	.....	.....	Amyl Acetate, (from pentane) drs gal.	1.60	1.70	1.70	1.60
				Tech., drs gal.	1.60	1.70	1.70	1.60
				Alcohol, see Fusel Oil				
				Furoate, 1 lb tins lb.		5.00		
.16½	.15½	.15½	.15	Aniline Oil, 960 lb drs lb.	.15½	.16½	.16½	.15½
.48	.41	.41	.41	Annatto, fine lb.	.34	.37	.37	.34
1.00	.90	.90	.90	Anthraquinone, sublimed, 125 lb bbls lb.	.80	.90	.90	.80
.12	.09½	.11½	.14	Antimony, metal slabs, ton lots lb.	.....	.09½	.10	.09½
.12	.10	.15½	.14	Needle, powd, 100 lb cs lb.	.....	.10	.10	.10
.18	.17	.17	.17	Chloride, soln (butter of) cbys lb.	.17	.18	.18	.17
.12	.09½	.16½	.16½	Oxide, 500 lb bbls lb.	.....	.09½	.10	.09½
.....	.....	.28	.25½	Salt, 66%, tins lb.	.25½	.26	.26	.25½
.20	.16	.20	.16	Sulfuret, golden, bbls lb.	.16	.20	.20	.16
.42	.38	.42	.37½	Vermilion, bbls lb.	.38	.42	.42	.38
.19	.17	.18	.18	Archil, conc, 600 lb bbls lb.	.17	.19	.19	.17
.14	.12	.12	.12	Double, 600 lb bbls lb.	.12	.14	.14	.12
.16	.15	.16	.14	Triple, 600 lb bbls lb.	.15	.16	.16	.15
.08	.08	.15	.12½	Argols, 80%, casks lb.	.....	.08	.08	.08
.16	.15	.08	.03	Coude, 30%, casks lb.	.15	.16	.16	.15
.11	.10½	.10½	.10½	Arsenic, Red, 224 lb kegs, cs. lb.	.09	.11	.11	.09
.04	.03½	.04	.03½	White, 112 lb kegs lb.	.04	.04½	.04½	.04
14.75	14.75	14.75	14.75	Asbestine, c-1 wks ton	.....	15.00	15.00	4.75

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cent. Inventories of ethyl alcohol at the end of the month increased 1,111,420 gallons over March, or 19 per cent., the report disclosed, the member manufacturers reporting 6,694,782 gallons on hand at the end of April, as against 5,583,362 gallons on hand at the end of March. The inventories of C. D. alcohol totaled 7,315,123 gallons, as compared with 5,716,625 gallons at the close of the previous month, an increase of 1,598,498 gallons, or 28 per cent. Inventories of S. D. alcohol were reported at a total of 1,065,443 gallons, compared with 1,141,550 gallons at the close of March, a decline of 76,107 gallons for the month, or 6 per cent. Aggregate stocks of all members at the end of April, 1929, amounted to 15,075,348 gallons, as compared with a total of 12,441,537 gallons at the close of March, 1929, or a total increase of 21 per cent. The combined inventories of all members at the close of April last year totaled 13,946,199 wine gallons, of which ethyl amounted to 6,925,493 gallons, C. D. alcohol 6,187,564 gallons and S. D. alcohol 833,142 gallons.

Ammonia — Has been very quiet during the past month with no buying in evidence. This is of course quite expected as this is the intermediate season when activity ceases. Shipments have been holding to good volume and are proceeding favorably.

Ammonium Chloride — The market has been normal for this season of the year and no developments of any interest are to be expected before the Fall.

Ammonium Sulfate — Has continued weak and marked by poor demand. Although the season generally has not been a poor one, it has by no means measured up to that of last year. Quotations are now at $2.25 per 100 lbs., with Southern points at $2.30, and some evidence of material being available below these figures. That the season here has not been so good is partially evidenced by export figures which show a considerable increase over the material exported last year, thus indicating a diminished market here. Exports during the first three months of 1929 amounted to 37,028 tons, as compared with 24,735 tons during the same period of 1928, and 45,961 tons in 1927. That export figures furnish a good indication of the conditions in this country is indicated by a comparison of figures for the last three years which reveals a steady decline in the quantities of ammonium sulfate exported from the United States. Ammonium sulfate is obtained almost exclusively in this country as a by-product of coke manufacture and the quantity available for export is contingent upon the

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Barium			
57.00	47.00	47.50	47.50	Barium, Carbonate, 200 lb bags wks....ton	58.00	60.00	57.00
.12½	.12	.12	.12	Chlorate, 112 lb kegs NY..lb.	.14	.15	.14
65.00	54.00	65.00	57.50	Chloride, 800 lb bbl wks...ton	65.00	68.00	63.00
.13½	.13	.13	.13	Dioxide, 88%, 690 lb drs...lb.	.12	.13	.12
.04½	.04½	.04½	.04½	Hydrate, 500 lb bbls.....lb.	.04½	.05½	.04½
.08	.07½	.07½	.07½	Nitrate, 700 lb casks.....lb.	.08½	.08½	.08½
24.00	23.00	23.00	23.00	Barytes, Floated, 350 lb bbls wks.....ton	23.00	24.00	24.00
8.00	5.00	.....	.....	Bauxite, bulk, mines.....ton	5.00	8.00	8.00
.38	.36	.40	.37	Beeswax, Yellow, crude bags..lb.	.....	.34	.37
.43	.41	.46	.38	Refined, cases.....lb.	.....	.41	.42
.58	.56	.58	.56	White, cases.....lb.	.51	.53	.53
.70	.65	.65	.65	Benzaldehyde, technical, 945 lb drums wks.....lb.	.60	.65	.65
				Benzene			
.23	.21	.23	.21	Benzene, 90%, Industrial, 8000 gal tanks wks.....gal.	.....	.23	.23
.23	.21	.23	.21	Ind. Pure, tanks works....gal.	.....	.23	.23
.74	.70	.70	.70	Benzidine Base, dry, 250 lb bbls.....lb.	.70	.74	.74
1.00	1.00	1.00	1.00	Benzoyl, Chloride, 500 lb drs.lb.	.....	1.00	1.00
.25	.25	.....	.....	Benzyl, Chloride, tech drs....lb.	.....	.25	.25
.26	.24	.24	.24	Beta-Naphthol, 250 lb bbl wk.lb.	.24	.26	.26
1.35	1.35	1.35	1.35	Naphthylamine, sublimed, 200 lb bbls.....lb.	.....	1.35	1.35
.65	.63	.63	.63	Tech, 200 lb bbls.....lb.	.60	.65	.68
90.00	80.00	80.00	80.00	Blanc Fixe, 400 lb bbls wks..ton	80.00	90.00	90.00
				Bleaching Powder			
2.25	2.25	2.25	2.00	Bleaching Powder, 300 lb drs c-1 wks contract.....100 lb.	.....	2.25	2.25
2.00	2.00	2.25	2.00	700 lb drs c-1 wks contract .....100 lb.	.....	4.00	4.00
5.25	4.65	3.75	4.75	Blood, Dried, fob, NY.....Unit	.....	4.25	4.60
5.35	4.75	.....	.....	Chicago.....Unit	.....	4.50	4.85
5.05	4.50	.....	.....	S. American shipt.....Unit	.....	4.25	4.70
.35	.31	.30	.28	Blues, Bronze Chinese Milori Prussian Soluble.....lb.	.....	.35	.35
30.00	29.00	38.00	29.00	Bone, raw, Chicago.....ton	.....	42.00	42.00
.07	.06	.06	.06	Bone, Ash, 100 lb kegs.....lb.	.06	.07	.07
.08½	.08½	.08½	.08½	Black, 200 lb bbls.....lb.	.....	.08½	.08½
37.00	31.00	30.00	28.00	Meal, 3% & 50%, Imp....ton	.....	31.00	35.00
.05	.2½	.04½	.04½	Borax, bags.....lb.	.02½	.03½	.03½
.12	.10½	.11	.11	Bordeaux, Mixture, 16% pwd..lb.	.10½	.12	.12
.10	.08	.08	.08	Paste, bbls.....lb.	.10	.10½	.10½
28.00	26.00	28.00	26.00	Brazilwood, sticks, shpmt....lb.	26.00	28.00	28.00
1.20	.60	.60	.60	Bronze, Aluminum, powd blk.lb.	.60	1.20	1.20
1.25	.55	.55	.55	Gold bulk.....lb.	.55	1.25	1.25
1.60	1.40	1.60	1.42	Butyl, Acetate, normal drs 1c-1 wks.....gal.	1.35	1.40	1.45
1.55	1.35	1.55	1.42	Tank, drs wks.....gal.	1.33	1.35	1.35
1.05	1.00	1.00	1.00	Secondary, 50 gal drs.....gal.	1.00	1.05	1.05
.70	.70	.70	.70	Aldehyde, 50 gal drs wks...lb.	.....	.70	.70
				Carbitol (see Diethylene Glycol Mono Butyl Ether).....	.....	.....	.....
				Cellosolve (see Ethylene glycol mono butyl ether).....			
				Furoate, tech., 50 gal. dr., lb.	.....	.50	.50
.36	.34	.34	.34	Propionate, drs.....lb.	.34	.36	.36
.60	.60	.60	.60	Stearate, 50 gal drs.....lb.	.....	.60	.60
.60	.57	.57	.57	Tartrate, drs.....lb.	.57	.60	.60
2.00	1.35	1.50	1.35	Cadmium, Sulfide, boxes.....lb.	.95	1.75	1.75
				Calcium			
4.50	3.50	3.50	3.50	Calcium, Acetate, 150 lb bags c-1.....100 lb.	.....	4.50	4.50
.09	.06	.07½	.07½	Arsenate, 100 lb bbls c-1 wks.....lb.	.07	.09	.09
.06	.05	.05	.05	Carbide, drs.....lb.	.05	.06	.06
1.00	1.00	1.00	1.00	Carbonate, tech, 100 lb bags c-1.....lb.	1.00	1.00	1.00
27.00	25.00	27.00	27.00	Chloride, Flake, 375 lb drs c-1 wks.....ton	.....	22.75	25.00
23.00	20.00	21.00	21.00	Solid, 650 lb drs c-1 fob wks .....ton	20.00	20.00	20.00
52.00	52.00	52.00	52.00	Nitrate, 220 lb bbls c-1 NY.ton	.....	52.00	52.00
.....	.....	.....	.....	Peroxide, 100 lb. drs.....lb.	.....	1.25	1.25
.08	.07	.09	.09	Phosphate, tech, 450 lb bbls lb.	.08	.08½	.08
				Stearate, 100 lb bbls.....lb.	.25	.26	.26
				Calurea, bags.....ton	.....	88.75	88.75
				S. points.....	.....	88.30	88.30
.18	.18	.....	.....	Camwood, Bark, ground bbls..lb.	.....	.18	.18
.28	.22	.33	.33	Candelilla Wax, bags.....lb.	.23	.24	.24
				Carbitol, (See Diethylene Gycol Mono Methyl Ether).....	.....	.....	.....
.15	.08	.08	.08	Carbon, Decolorizing, 40 lb bags c-1.....lb.	.08	.15	.15
.12	.12	.12	.12	Black, 100-300 lb cases 1c-1 NY.....lb.	.....	.12	.12
.06	.05½	.05½	.05½	Bisulfide, 500 lb drs 1c-1 NY.....lb.	.05½	.06	.06
.06	.06	.06	.06	Dioxide, Liq. 20-25 lb cyl...lb.	.....	.06	.06
.07½	07	.07	.07	Tetrachloride, 1400 lb drs delivered.....lb.	.06½	.07½	.07½
.58	.45	.50	.50	Carnauba Wax, Flor, bags....lb.	.40	.41	.43
.60	.40	.90	.54	No. 1 Yellow, bags.....lb.	.36	.37	.40
.38	.34	37	.24	No. 2 N Country, bags.....lb.	.....	.30	.32
.56	.38	.68	.48	No. 2 Regular, bags.....lb.	.34	.35	.36
.32	.25	.....	.....	No. 3 N. C.....lb.	.....	.25	.25
.32	.25½	.....	.....	No. 3 Chalky.....lb.	.....	.25½	.26
.18½	.14½	.18½	.15½	Casein, Standard, ground.....lb.	.15½	.16	.16


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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - May 1929 $1.04

domestic sales. The loss of more than 45,000 tons in American sales for 1928 is not due to a decreased consumption abroad, for Germany and England are now shipping increasing quantities to foreign markets. Rather, it is attributable to the greatly increased consumption within the United States, which likewise is reflected by the considerable growth in imports of sulfate of ammonia, from 17,000 tons in 1927 to more than 42,000 in 1928.

Antimony — Has been quiet, easy and inactive during most of the past month, with some improvement noticeable towards the end of the month. At one time quotations on the metal were down below 9c lb., but some recovery was shown and quotations are now at 9¼c lb. Needle and oxide have also been lower but at present are at the same figures as quoted last month, 10c lb. on the needle and 9½c lb. on the oxide.

Barium Chloride — Continues in good demand with prices firm at quoted levels.

Benzene — Moves into consuming channels as fast as produced and during the past month the volume has been heavier than at the same time last year. This is in spite of increased production.

Blood — Has been weak and characterized by almost a total lack of demand. As a result prices have declined 25c per unit since last quoted, with the season practically over.

Calcium Acetate — Continues in very heavy demand from producers of acetic acid. Supplies are limited and move into consumption just as fast as the material is produced. The March output of acetate of lime was 12,081,831 pounds, as compared with 11,266,054 pounds in February and 13,022,129 pounds in March, 1928. Exports of acetate of lime during 1928 amounted to 11,172,695 pounds, valued at $373,278. This was divided among the following countries as follows: Japan, 9,654,534 pounds, valued at $320,426; Italy, 677,173 pounds, valued at $20,160; United Kingdom, 498,438 pounds, valued at $17,650; Canada, 176,867 pounds, valued at $7,999; Cuba, 25,200 pounds, valued at $1,071; Honduras, 1,840 pounds, valued at $35; Dominican Republic, 1,328 pounds, valued at $34; and other countries, 137,305 pounds, valued at $5,903.

Calcium Chloride — Preliminary reports for the last month indicate that sales volume will exceed that of May of last year, despite the unseasonable weather which has interfered to a great extent with the use as a dust layer. Volume during April was ahead of that of last year, as is the volume for the first four months of the year. The situation is generally very fine

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Cellosolve (see Ethylene glycol mono ethyl ether)			
				Acetate (see Ethylene glycol mono ethyl ether acetate)			
.30	.26	.34	.26	Celluloid, Scraps, Ivory cs. lb.	.26	.30	.26
.20	.18	.18	.18	Shell, cases lb.	.18	.20	.20 .18
.32	.30	.34	.26	Transparent, cases lb.	.30	.32	.32 .30
1.40	1.40	1.40	1.40	Cellulose, Acetate, 50 lb kegs lb.	1.20	1.25	1.25 1.20
.03½	.03	.03	.03	Chalk, dropped, 175 lb bbls. lb.	.03	.03½	.03½ .03
.04½	.04½	.02½	.02½	Precip, heavy, 560 lb cks. lb.	.02	.03½	.03½ .02
.03½	.02½	.04½	.04½	Light, 250 lb casks lb.	.02½	.03½	.03½ .02½
.19	.18	.18	.18	Charcoal, Hardwood, lump, bulk wks bu.	.18	.19	.19 .18
.06½	.06	.06	.06	Willow, powd, 100 lb bbl wks lb.	.06	.06½	.06½ .06
.05	.04	.04	.04	Wood, powd, 100 lb bbls. lb.	.04	.05	.05 .04
.03	.02	.03	.02½	Chestnut, clarified bbls wks, lb.	.02½	.03	.02 .03½
.02	.01½	.02	.01½	25% tks wks lb.	.01½	.02	.02 .01½
.04 4/5	.04 4/5	.05½	.05½	Powd, 60%, 100 lb bgs wks lb.	.....	.04 4/5	.04 4/5 .04 4/5
.06	.05½	.06½	.06½	Powd, decolorized bgs wks. lb.	.05½	.06	.06 .05½
9.00	8.00	8.00	8.00	China Clay, lump, blk mines ton	8.00	9.00	9.00 8.00
.02	.01½	.01½	.01½	Powdered, bbls lb.	.01½	.02	.02 .01½
12.00	10.00	10.00	10.00	Pulverized, bbls wks ton	10.00	12.00	12.00 10.00
25.00	15.00	15.00	15.00	Imported, lump, bulk ton	15.00	25.00	25.00 15.00
.03½	.03	.03	.03	Powdered, bbls lb.	.03	.03½	.03½ .03
				Chlorine			
.09	.08	.08	.08	Chlorine, cyls 1c-1 wks contract lb.	.07½	.08½	.08½ .07½
.....	.....	.....	.....	cyls, cl wks,. contract lb.	.....	.04½	.04½ .04½
.03½	.03½	.05½	.04	Liq tank or multi-car lot cyls wks contract lb.	.....	.03	.03 .03
.07	.07	.07	.07	Chlorobenzene, Mono, 100 lb. drs 1c-1 wks lb.	.08½	.09½	.09½ .08½
.22	.20	.20	.20	Chloroform, tech, 1000 lb drs. lb.	.18	.20	.20 .18
1.35	1.00	1.00	1.00	Chloropicrin, comml cyls lb.	1.00	1.35	1.35 1.00
.29	.26	.27	.26	Chrome, Green, CP lb.	.26	.29	.29 .26
.11	.06½	.06½	.06½	Commercial lb.	.06½	.11	.11 .06½
.17	.15½	.17½	.16½	Yellow lb.	.17	.18	.18 .15
.05½	.04½	.05	.04½	Chromium, Acetate, 8% Chrome bbls lb.	.04½	.05½	.05½ .04½
.05½	.05½	.05½	.05½	20° soln, 400 lb bbls lb.	.....	.05½	.05½ .05½
.28	.27	.27	.27	Fluoride, powd, 400 lb bbl. lb.	.27	.28	.28 .27
.35½	.34½	.34½	.34½	Oxide, green, bbls lb.	.34½	.35½	.35½ .34½
9.50	9.00	9.50	9.00	Coal tar, bbls bbl	10.00	10.50	10.50 10.00
2.22	2.10	2.10	2.10	Cobalt Oxide, black, bags lb.	2.10	2.22	2.22 2.10
.87	.84	.92	.77	Cochineal, gray or black bag. lb.	.....	.95	.95 .95
.86	.86	.92	.77	Teneriffe silver, bags lb.	.....	.95	.95 .95
				Copper			
17.00	12.90	13.57½	12.90	Copper, metal, electrol 100 lb.	.....	17.78	24.00 17.00
.17½	.16	.16¼	.06½	Carbonate, 400 lb bbls lb.	.19	.25	.25 .18
.28	.28	.28	.28	Chloride, 250 lb bbls lb.	.25	.28	.28 .25
.50	.48	.48	.48	Cyanide, 100 lb drs lb.	.50	.55	.60 .48
.17	.16½	.16½	.16½	Oxide, red, 100 lb bbls lb.	.24	.32	.32 .16½
.19	.18	.18	.17	Sub-acetate verdigris, 400 lb bbls lb.	.18	.19	.19 .18
5.50	5.05	5.00	4.75	Sulfate, bbls c-1 wks 100 lb.	.....	6.00	7.00 5.65
14.00	13.00	17.00	13.00	Copperas, crys and sugar bulk c-1 wks ton	13.00	14.00	14.00 13.00
1.35	1.25	1.25	1.25	Sugar, 100 lb bbls 100 lb.	1.25	1.35	1.35 1.25
.42	.40	.40	.40	Cotton, Soluble, wet, 100 lb bbls lb.	.40	.42	.42 .40
.....	.....	42.00	20.00	Cottonseed, S. E. bulk c-1 ton	.....	.....	....
.....	.....	42.00	20.00	Meal S. E. bulk ton	.....	.....	....
38.00	36.00	35.00	21.50	7% Amm., bags mills ton	37.50	38.00	38.00 37.50
.27½	.26	.27	.22	Cream Tartar, USP, 300 lb. bbls lb.	.....	.27	.28 .27
.42	.40	.40	.40	Creosote, USP, 42 lb cbys lb.	.40	.42	.42 .40
.19	.17	.20	.20	Oil, Natural, 50 gal drs. gal.	.17	.19	.19 .17
.23	.21	.25	.25	10-15% tar acid gal.	.21	.23	.23 .21
.28	.25	.....	.....	25-30% tar acid gal.	.25	.28	.28 .25
.20	.17½	.17½	.17½	Cresol, USP, drums lb.	.14	.17	.17 .14
.17	.16	.17	.16	Crotonaldehyde, 50 gal dr. lb.	.32	.36	
.18½	.18½	.18½	.15	Cudbear, English lb.	.16	.17	.17 .16
.07	.06	.05	.05½	Cutch, Rangoon, 100 lb bales. lb.	.14	.16	.16 .14
1.75	1.67½	1.82½	1.67½	Borneo, Solid, 100 lb bale. lb.	.08	08½	.08½ .08
5.12	3.77	3.92	3.77	Cyanamide, bulk c-1 wks Amm. lb.	.....	1.70	1.70 1.70
5.07	3.72	3.87	3.72	Dextrin, corn, 140 lb bags 100 lb.	4.62	4.82	4.82 4.62
.09	.08	.08½	.08½	White, 130 lb bags 100 lb.	4.57	4.77	4.77 4.57
.09	.08	.08½	.08½	Potato, Yellow, 220 lb bgs. lb.	.08	.09	.09 .08
.08½	.08	.08½	.08	White, 220 lb bags 1c-1 lb.	.08	.09	.09 .08
.....	.....	3.80	3.80	Tapioca, 200 lb bags 1c-1 lb.	.08	.08½	.08½ .08
3.80	3.80	2.95	2.85	Diaminophenol, 100 lb kegs. lb.	.....	3.80	3.80 3.80
2.90	2.85	3.25	3.25	Diamylphthalate, drs wks gal.	.....	3.80	3.80 3.80
.28	.26½	.31½	.29½	Dianisidine, 100 lb kegs lb.	3.00	3.10	3.10 3.00
.31½	.29½	.55	.55	Dibutylphthalate, wks lb.	.....	.26½	.26½ .26½
.....	.....	.....	.....	Dibutyltartrate, 50 gal drs. lb.	.29½	.31½	.31½ .29½
.65	.55	.23	.23	Dichloroethylether, 50 gal drs lb.	.05	.07	.13 .05
.25	.23	2.15	2.15	Dichloromethane, drs wks lb.	.55	.65	.65 .55
2.15	2.15	1.85	1.85	Diethylamine, 400 lb drs. lb.	.23	.25	.25 .23
2.00	1.85	.55	.55	Diethylcarbonate, drs gal.	1.85	1.90	1.90 1.85
.60	.55.	20	.20	Diethylaniline, 850 lb drs. lb.	.55	.60	.60 .55
.15	.10	.....	.....	Diethyleneglycol, drs lb.	.10	.12	.13 .10
.35	.25	.....	.....	Mono ethyl ether, drs. lb.	.13	.15	.15 .13
.....	.....	.....	.....	Mono butyl ether, drs. lb.	.28	.30	.30 .25
.....	.....	.....	.....	Mono methyl ether, 50 gal. dr lb.	.15	.18	.15 .13 .22 .15
.67	.64	.64	.64	Diethylene oxide, 50 gal dr. lb.	.....	.50	.50 .50
.26	.24	.25	.25	Diethylortho toluidin, drs. lb.	.64	.67	.67 .64
.35	.30	.30	.30	Diethyl phthalate, 1000 lb drums lb.	.24	.26	.26 .24
2.62	2.62	2.60	2.60	Diethylsulfate, technical, 50 gal drums lb.	.30	.35	.35 .30
.32	.30	.32	.30	Dimethylamine, 400 lb drs. lb.	.....	2.62	2.62 2.62
				Dimethylaniline, 340 lb drs. lb.	.30	.32	.32 .30

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Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - May 1929 $1.04

and the use of this material seems to be constantly widening.

Carnauba Wax — In common with the other waxes, has remained practically unchanged throughout the entire month. In some quarters it is expected that prices will advance as soon as any demand becomes evident for it is said that stocks are low, both here and in the primary market.

Casein — For the third month in succession the quotations remain unchanged and with but little activity noted in the market. Everybody seems to be well supplied as a result of the tremendous buying activity which characterized the first of the year, and the market remains dormant.

Chlorine — Although demand for this material has been consistently good, the past month seems to have indicated an even more favorable condition. This improvement is probably due to more settled conditions within the paper and pulp industries. Indications now point to a larger volume of business in the second quarter than was experienced during the first quarter of the year.

Copper Sulfate — Has been very quiet during the past month, much more so than is usual during May. Nowhere near the amount of new business has been entered during the month as was the case during May of last year, or as is generally the case during May. Buyers seem to be waiting further declines in price, but such reductions are not thought likely to occur even if the price of copper should go lower. The metal price has been steady now since April 15, and even if further reductions should occur, it is not thought likely that the sulfate will be reduced accordingly. Producers seem to feel that the demand should be sufficient to maintain prices at existing levels and they expect that changes, if any, will be upward. The *"Chemist & Druggist,"* London, in speaking of the price advances of copper sulfate following the climb in metal prices of about two months ago says that "these happenings were naturally viewed with dismay in the European legitimate trade and aroused more irritation on the part of manufacturers and consumers when the fact was revealed that the record rise in copper was largely the outcome of reckless American manipulation, because at no time has there been any actual scarcity of these metals. The price of rough standard bar copper was taken up to £97 15s. a ton, the highest figure touched since the year 1920, which was still within influence from the war. The market in the earlier part of that year was still under Government control. It was, of course,

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.50	.45	.45	.45	Dimethylsulfate, 100 lb drs...lb.	.45	.50	.50	.45
.16½	.15½	.15½	.15	Dinitrobenzene, 400 lb bbls...lb.	.15½	.16½	.16½	.15½
.19	.18	.18	.18	Dinitrochlorine, 300 lb bbl....lb.	.18	.19	.19	.18
.16	.15	.15	.15	Dintrochlorobenzene, 400 lb bbls.....lb.	.13	.15	.15	.1:
.34	.32	.32	.32	Dinitronaphthalene, 350 lb bbls .....lb.	.34	.37	.37	.34
.32	.31	.31	.31	Dinitrophenol, 350 lb bbls....lb.	.31	.32	.32	.31
.19	.18	.18	.15	Dinitrotoluene, 300 lb bbls...lb.	18	.19	.19	.18
.90	.48	1.05	.85	Diorthotolyguanidine, 275 lb bbls wks.....lb.	.42	.46	.49	.42
.....	.....	.....	.....	Dioxan (See Diethylene Oxide)	.....	.....	.....	.....
				Diphenyl.....lb.	.40	.50	.50	.40
.47	.45	.18	.45	Diphenylamine.....lb.	.....	.40	.47	.40
.72	.40	.....	.....	Diphenylguanidine, 100 lb bbl lb.	.30	.35	.40	.30
.30	.26	.26	.26	Dip Oil, 25%, drums.....lb.	.26	.30	.30	.26
62.00	58.00	49.00	41.00	Divi Divi pods, bgs shipmt..ton	.....	50.00	57.00	50.00
.05½	.05	.04	.04	Extract.....lb.	.05	.05½	.05½	.05
.82	.73	.84	.72	Egg Yolk, 200 lb cases.....lb.	.82	.84	.84	.77
1.75	1.7	2.00	1.75	Epsom Salt, tech, 300 lb bbls c-1 NY.....100 lb.	1.70	1.75	1.75	1.75
.38	.37	.45	.37	Ether, USP, 1880, 50 lb drs..lb.	.38	.39	.39	.38
1.05	.75	.90	.90	Ethyl Acetate, 85% Ester, 110 gal drs.....gal.	.95	.98	1.05	.95
1.25	1.10	1.10	1.03	99% gal drums.....gal.	1.15	1.18	1.25	1.15
.....	.....	.....	.....	Acetoacetate, 50 gal drs...gal.	.65	.68	.68	.65
1.11	1.05	1.05	1.05	Benzylaniline, 300 lb drs...lb.	1.05	1.11	1.11	1.05
.70	.70	.50	.50	Bromide, tech, drums .....lb.	.50	.55	.55	.50
.....	.....	.....	.....	Carbonate, 90%, 50 gal drs gal.	1.85	1.90	1.90	1.85
.22	.22	.22	.22	Chloride, 200 lb. drums....lb.	.....	.22	.22	.22
.....	.....	.....	.....	Chlorocarbonate, 50 gal dr .gal.	.35	.40	.40	.35
.....	.....	.....	.....	Ether, Absolute, 50 gal drs..lb.	.50	.52	.52	.50
				Furoate, 1 lb tins .....lb.	.....	5.00	5.00	5.00
3.50	3.50	3.50	3.50	Lactate, drums works.....lb.	.25	.29	.35	.25
.30	.30	.30	.30	Methyl Ketone, 50 gal drs..lb.	.....	.30	.30	.30
.55	.45	.45	.45	Oxalate, drums works.....lb.	.45	.55	.55	.45
.36	.30	.....	.....	Oxybutyrate, 50 gal drs wks.lb.	.....	.30½	.36	.30
.70	.70	.70	.70	Ethylene Bromide, 60 lb dr...lb.	.....	.70	.70	.79
.85	.75	.75	.75	Chlorhydrin, 40%, 50 gal drs chloro. cont.....lb.	.75	.85	.85	.75
.11	.07	.15	.11	Dichloride, 50 gal drums...lb.	.05	.07	.10	.05
.40	.25	.30	.30	Glycol, 50 gal drs wks.....lb.	.25	.28	.30	.25
.27	.31	.....	.....	Mono Butyl Ether drs wks.	.23	.27	.31	.23
.20	.24	.....	.....	Mono Ethyl Ether drs wks	.16	.20	.24	.16
.23	.26	.....	.....	Mono Ethyl Ether Acetate dr. wks.....	.19	.23	.26	.19
				Mono Methyl Ether, drs.lb.	.19	.23	.23	.19
				Oxide, cyl.....lb.	.....	2.00		
.65	.62	.62	.62	Ethylidenaniline.....lb.	.62	.65	.65	.62
25.00	20.00	20.00	20.00	Feldspar, bulk.....ton	40.00	25.00	25.00	20.00
21.00	15.00	15.00	15.00	Powdered, bulk works.....ton	15.00	.21	21.00	15.00
.09	.07½	.07½	.07½	Ferric Chloride, tech, crystal 475 lb bbls.....lb.	.07½	.09	.09	.07½
5.50&10	4.90&10	5.60	4.15	Fish Scrap, dried, wks.....unit	.....	Nom.	Nom.	Nom.
4.75&50	4.00&50	3.50	4.24	Acid, Bulk 7 & 3½% delivered Norfolk & Balt. basis...unit	.....	Nom.	Nom.	Nom.
1.15	1.10	1.10	.90	Flavine, lemon, 55 lb cases...lb.	1.10	1.15	1.15	1.10
1.15	1.10	1.10	.85	Orange, 70 lb cases.....lb.	1.10	1.15	1.15	1.10
				Flaxseed.....lb.	.....	.....		
.....	.....	.....	.....	Ex-dock.....ton	.....	25.00	25.00	25.00
25.00	25.00	25.00	25.00	Fluorspar, 98%, bags.....	41.00	46.00	46.00	41.00
				Formaldehyde				
.....	.....	.....	.....	Formaldehyde, aniline, 100 lb.	.....	.....	.....	.....
.42	.39	.39	.39	drums.....lb.	.39	.42	.42	.39
.09	.08½	.11½	.08½	USP, 400 lb bbls 1c-1 wks..lb.	.09½	.10	.10	.09½
.04	.02½	.02½	.02½	Fossil Flour.....lb.	.02½	.04	.04	.02½
20.00	15.00	15.00	15.00	Fullers Earth, bulk, mines..ton	15.00	20.00	20.00	15.00
30.00	25.00	25.00	25.00	Imp. powd c-1 bags.....ton	25.00	30.00	30.00	25.00
.19½	.1 ½	.17½	.17½	Furfural 500 lb drums .....lb.	.17½	.19½	.19½	.17½
.....	.....	.....	.....	Furfuramide (tech) 100 lb dr..lb.	.....	.30	.30	.30
.....	.....	.....	.....	Furfuryl Acetate, 1 lb tins....lb.	.....	5.00	5.00	5.00
.....	.....	.....	.....	Alcohol, 100 lb dr.....lb.	.....	.50	.50	.50
.....	.. ..	.....	.....	Furoic Acid (tech) 100 lb dr...lb.	.....	.50	1.00	.50
1.35	1.35	1.69	1.35	Fusel Oil, 10% impurities ...gal.	.....	1.35	1.35	1.35
.05	.04	.04	.04	Fustic, chips.....lb.	.04	.05	.05	.04
.22	.20	.20	.20	Crystals, 100 lb boxes.....lb.	.20	.22	.22	.20
.10	.09	.09	.09	Liquid, 50°, 600 lb bbls....lb.	.09	10	.10	.09
.23	.20	.20	.20	Solid, 50 lb boxes.....lb.	.14	.16	.16	.14
32.00	30.00	30.00	30.00	Sticks.....ton	25.00	26.00	26.00	25.00
.52	.50	.50	.50	G Salt paste, 360 lb bbls.....lb.	.45	.50	.52	.45
21	.20	.20	.20	Gall Extract.....lb.	.20	.21	.21	.20
.09	.08	.08	.06	Gambier, common 200 lb cs...lb.	.06	.07	.07	.06
.14	.12	.12	.12	25% liquid, 450 lb bbls....lb.	.12	.14	.14	.12
.12	.11	.23	.11	Singapore cubes, 150 lb bg..lb.	.08½	.09	.09	.08½
.50	.45	.45	.30	Gelatin, tech, 100 lb cases...lb.	.45	.50	.50	.45
3.24	3.14	3.14	3.14	Bags, c-1 NY.....100 lb.	3.14	3.24	3.24	3.14
1.00	.70	1.05	1.05	Glauber s Salt, tech, c-1 wks.....100 lb.	1.00	1.70	1.70	.70
3.34	3.24	3.24	3.24	Glucose (grape sugar) dry 70-80° bags c-1 NY.....100 lb.	3.24	3.34	3.34	3.20
3.14	3.14	3.14	3.14	Tanner's Special, 100 lb bags .....100 lb.	.....	3.14	3.14	3.14
.24	.20	.20	.20	Glue, medium white, bbls ...lb.	.20	.24	.24	.20
.26	.22	.22	.22	Pure white, bbls.....lb.	.22	.26	.26	.22
.19	.15	.29	.22	Glycerin, CP, 550 lb drs.....lb.	.15½	.16	.16	.15½
.15	.11½	.25	.17	Dynamite, 100 lb drs.....lb.	.12	.12½	.12½	.12
.10½	.08½	.....	.....	Saponification, tanks.....lb.	.08½	.08½	.08½	.08½
.09½	.07½	.....	.....	Soap Lye, tanks.....lb.	.....	.07½	.07½	.07½
35.00	15.00	15.00	15.00	Graphite, crude, 220 lb bgs...ton	15.00	35.00	35.00	15.00
.09	.06	.05	.05	Flake, 500 lb bbls.....lb.	.06	.09	.09	.06
				Gums				
.04½	.03½	.03½	.03½	Gum Accroides, Red, coarse and fine 140-150 lb bags.....lb.	.03½	.04½	.04½	.03½
.06½	06	.06	.06	Powd, 150 lb bags .....lb.	.06	.06½	.06½	.06

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - May 1929 $1.04

not to be expected that the price would remain for very long in the neighborhood of £100, which figure was actually paid privately for forward delivery when the excitement was greatest. Within the last few weeks there has been a sharp swing of the pendulum in the other direction, resulting in a fall by about twenty-five per cent. in metal to £74 5s. per ton. Sulfate prices, which had been inevitably run up to as high as £35 a ton f. o. b. for casks, less the usual five per cent. discount, tumbled sharply in sympathy with the metal, and the latest terms are in the neighborhood of £29. This is still about £1 10s. a ton above the figure ruling at the close of last year, when the cost of bar copper stood at £74 10s., but since the lowest touched last week there has been a recovery in the metal by nearly £5 a ton. The current value of sulfate would appear to be about high enough, but there is some nervousness that in view of the marked depletion of the home warehouse stocks in the course of this month the metal position is apt to become more stringent. Hence sulfate makers, although having by now fairly well covered their needs for this season, are quoting rather stiff terms as a matter of precaution. As compared with a year or so ago, the present price of this commodity indicates an appreciation of about £2 10s. per ton.

Egg Yolk — Although prices remain unchanged, there is every reason to believe that they will be lowered shortly, just as soon as the new crop begins to come in in appreciable quantities. Some indication of the price range which may be expected is given by quotations from June 15, which are at 76c @ 78c lb., as compared with present quotations of 82c @ 84c lb.

Formaldehyde — Continues in very good position and in excellent demand with supplies moving into consuming channels as fast as they are available.

Glycerin — During the past month the market has been very quiet with a weak tendency evident. Domestic production of glycerin during the quarter ended March 31, has been as follows: crude—Production, 36,603,729 pounds, consumption, 39,664,503 pounds, stocks, 18,393,056 pounds; dynamite—production, 14,177,795 pounds, consumption, 5,812,725 pounds, stocks, 12,567,955 pounds; CP—production, 17,720,507 pounds, consumption, 2,485,894 pounds, stocks, 10,022,450 pounds. Exports of glycerin from the United States for the quarter ended March 31 increased to 546,619 pounds, valued at $72,341 from 409,331 pounds with a value of $53,816 in the corresponding period of 1928. During the first three months of 1929, imports of glycerin, both

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.20	.18	.18	.18	Yellow, 150-200 lb bags....lb.	.18	.20	.20	.18
				Animi (Zanzibar) bean & pea				
.40	.35	.40	.35	250 lb cases.....lb.	.35	.40	.40	.35
.55	.50	.60	.50	Glassy, 250 lb cases.....lb.	.50	.55	.55	.50
				Asphaltum, Barbadoes (Manjak)				
.12	.09	.09	.09	200 lb bags.....lb.	.09	.12	.12	.09
.17	.15	.15	.15	Egyptian, 200 lb cases.....lb.	.15	.17	.17	.15
				Gilsonite Selects, 200 lb bags				
65.00	55.00	55.00	55.00	.....ton	58.00	65.00	65.00	58.00
				Damar Batavia standard 136, lb				
.26	.22½	.26½	.26½	cases.....lb.	.23	.24	.26	.23
.11	.10½	.10½	.07	Batavia Dust, 160 lb bags.....lb.	.10½	.11	.11	.10½
.17½	.16	.18½	.17½	E Seeds, 136 lb cases.....lb.	.17	.17½	.17½	.17
				F Splinters, 136 lb cases and				
.14½	.13	.14	.09	bags.....lb.	.13	.13½	.13½	.13
.30½	.29½	.34	.33½	Singapore, No 1, 224 lb cases lb.	.29	.30	.30½	.29
.24	.20	.22½	.21	No. 2, 224 lb cases.....lb.	.23	.23½	.24	.23
.15	.13½	.14	.11	No. 3, 180 lb bags.....lb.	.13½	.14	.14	.13½
				Benzoin Sumatra, U. S. P. 120 lb				
.48	.33	.35	.30	cases.....lb.	.38	.40	.40	.38
				Copal Congo, 112 lb bags, clean				
.15	.14	.14	.12	opaque.....lb.	.14	.15	.15	.14
.09	.08½	.08½	.08½	Dark, amber.....lb.	.08½	.09	.09	.08½
.14	.12½	.12½	.12½	Light, amber.....lb.	.12½	.14	.14	.12½
.36	.35	.35	.35	Water white.....lb.	.35	.36	.36	.35
.65	.58	.....	.....	Mastic.....lb.	.60	.62	.62	.60
				Manila, 180-190 lb baskets				
.17½	.16	.16	.16	Loba A.....lb.	.17	.17½	.17½	.17
.16½	.15	.15	.15	Loba B.....lb.	.16	.16½	.16½	.16
.14	.13	.14½	.13	Loba C.....lb.	.14	.14½	.14½	.14
.19	.16	.16	.16	Pale bold, 224 lb cs.....lb.	.17	.19	.19	.17
.13½	.12	.14	.12	Pale nubs.....lb.	.13	.13½	.13½	.13
.11	.07½	.07½	.07½	East Indies chips, 180 lb bags lb.	.10	.11	.11	.10
.21	.17	.....	.....	Pale bold, 180 lb bags....lb.	.20	.21	.21	.20
.16	.14	.17	.17	Pale nubs.....lb.	.15	.16	.16	.15
.....	.....	.....	.....	Pontianak, 224 lb cases....lb.	.....	.....		
.25½	.22	.29	.25	Pale bold gen No 1.....lb.	.22	.23	.23	.22
.15	.13	.19	.13	Pale gen chips spot.....lb.	.14½	.15	.15	.14½
.14	.13	.14	.13	Elemi, No. 1, 80-85 lb cs...lb.	.13½	.14	.14	.13½
.13½	.13	.13	.12	No. 2, 80-85 lb cases.....lb.	.13	.13½	.13½	.13
.13	.12	.13	.11	No. 3, 80-85 lb cases.....lb.	.12	.13	.13	.12
				Kauri, 224-226 lb cases No. 1				
.57	.50	.67½	.57	.....	.50	.57	.57	.50
.38	.35	.44½	.38	No. 2 fair pale.....lb.	.35	.38	.38	.35
				Brown Chips, 224-226 lb				
.12	.10	.14½	.10	cases.....lb.	.10	.12	.12	.10
.....	.....	.42	.38	Bush Chips, 224-226 lb	.....	.....		
.40	.38	.....	.....	cases.....lb.	.38	.40	.40	.38
.....	.....	.....	.....	Pale Chips, 224-226 lb cases				
.26	.24½	.31½	.24½	.....lb.	.24½	.26	.26	.24½
				Sandarac, prime quality, 200				
.60	.26	.27	.25	lb bags & 300 lb casks...lb.	.67	.68	.68	.60
.....	.....	.....	.....	Helium, 1 lit. bot. .....lit.	.....	25.00	.20	.17
.20	.17	.12	.12	Hematine crystals, 400 lb bbls lb.	.17	.20	.11	.17
.11	.11	.09	.09	Paste, 500 bbls.....lb.	.....	.11	.11	.11
.03½	.03½	.03½	.03½	Hemlock 25%, 600 lb bbls wks lb.	.03½	.03½	.03½	.03½
16.00	16.00	16.00	16.00	Bark.....ton	.....	16.00	17.00	16.00
.60	.60	.60	.45	Hexalene, 50 gal drs wks.....lb.	.....	.60	.60	.60
.56	.62	.80	.62	Hexamethylenetetramine, drs .lb.	.48	.50	.58	.48
4.00	4.00	3.35	2.75	Hoof Meal, fob Chicago....unit	.....	3.85	4.00	3.90
.....	.....	3.90	3.0	South Amer. to arrive....unit	.....	3.85	3.90	3.85
				Hydrogen Peroxide, 100 vol, 140				
.26	.24	.30	.22	lb cbys.....lb.	.24	.26	.26	.24
.15	.12	.12	.12	Hypernic, 51°, 600 lb bbls....lb.	.12	.15	.15	.12
1.30	1.28	1.28	1.20	Indigo Madras, bbls.....lb.	1.28	1.30	1.30	1.28
.18	.15	.15	.18	20% paste, drums.....lb.	.15	.18	.18	.15
.08	.07½	.07½	.07½	Solid, powder.....lb.	.07½	.08	.08	.07½
				Iron Chloride, see Ferric or				
				Ferrous				
.10	.09	.09	.09	Iron Nitrate, kegs.....lb.	.09	.10	.10	.09
3.25	2.50	2.50	2.50	Coml, bbls.....100 lb.	2.50	3.25	3.25	2.50
.12	.10	.10	.10	Oxide, English.....lb.	.10	.12	.12	.10
.03½	.02½	.02½	.02½	Red, Spanish.....lb.	.02½	.03½	.03½	.02½
.90	.85	.85	.85	Isopropyl Acetate, 50 gal drs gal.	.85	.90	.90	.85
.20	.17	.29	.17	Japan Wax, 224 lb cases.....lb.	.....	.17	.18	.17
70.00	60.00	60.00	60.00	Kieselguhr, 95 lb bgs NY....ton	60.00	70.00	70.00	60.00
.....	.....	14.00	13.00	Lead Acetate, bbls wks...100 lb.	13.00	13.50	13.50	13.00
				White crystals, 500 lb bbls				
13.50	13.00	14.00	13.00	wks.....100 lb.	14.00	14.50	14.50	14.00
.15	.13	.15½	.13½	Arsenate, drs 1c-1 wks.....lb.	.13	.15	.15	.13
				Dithiofuroate, 100 lb dr....lb.	.....	1.00		
6.25	6.25	7.80	6.20	Metal, c-1 NY.....100 lb.	.....	7.75	7.75	6.10
.14	.14	.14	.14	Nitrate, 500 lb bbls wks....lb.	.....	.14	.14	.14
.18	.17½	.17½	.17½	Oleate, bbls.....lb.	.17½	.18	.18	.17½
.08½	.08½	.10½	.08½	Oxide Litharge, 500 lb bbls.lb.	.....	.08½	.08½	.08½
.09½	.09½	.11½	.09½	Red, 500 lb bbls wks....lb.	.....	.09½	.09½	.09½
.09	.09	.09½	.09	White, 500 lb bbls wks...lb.	.....	.09½	.09½	.09
.08½	.08½	.09	.08½	Sulfate, 500 lb bbls wk...lb.	.....	.08½	.08½	.08½
				Leuna saltpetre, bags.....ton	.....	62.20	62.20	62.20
				S. points .....ton	.....	62.95	62.95	62.95
4.50	4.50	4.50	4.50	Lime, ground stone bags.....ton	.....	4.50	4.50	4.50
1.05	1.05	1.05	1.05	Live, 325 lb bbls wks...100 lb.	.....	1.05	1.05	1.05
				Lime Salts, see Calcium Salts				
.17	.15	.15	.15	Lime-Sulfur soln bbls.....gal.	.15	.17	.17	.15
				Lithopone, 400 lb bbls 1c-1 wks				
.06½	.06½	.06½	.06½	.....lb.	.....	.05½	.06½	.05½
.08½	.08½	.08½	.08½	Logwood, 51°, 600 lb bbls.....lb.	.08½	.08½	.08½	.08½
.03½	.03	.03	.03	Chips, 150 lb bags.....lb.	.03	.03½	.03½	.03
.12½	.12½	.12	.12	Solid, 50 lb boxes.....lb.	.....	.12½	.12½	.12½
27.00	26.00	26.00	26.00	Sticks.....ton	24.00	26.00	26.00	24.00
.08	.07½	.07½	.07½	Lower grades.....lb.	.07½	.08	.08	.07½
.30	.30	.30	.30	Madder, Dutch.....lb.	.22	.25	.25	.22
50.00	48.00	48.00	48.00	Magnesite, calc, 500 lb bbl...ton	50.00	60.00	60.00	50.00
				Magnesium				
				Magnesium Carb, tech, 70 lb				
.06½	.06	.06½	.06	bags NY.....lb.	.06	.06½	.06½	.06

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - May 1929 $1.04

crude and refined, amounted to 7,141,586 pounds valued at $489,892 compared to 1,554,228 pounds, with a value of $196,541 in the same period of 1928.

Glauber's Salt — Prices have been advanced during the past month to a basis of $1.00 @ $1.70 per 100 lbs., depending upon package and quantity. This has been due to increased demand and some evidence of impending scarcity due to difficulty of production during warm weather and lack of imported material.

Gums — All prices have remained unchanged during the past month with business moving in rather spotty fashion, in direct contrast to the steady sales which prevailed throughout April. The demand for gum copal at Antwerp during March was slow and sales were not important in volume, according to the Department of Commerce. Buyers were hesitant owing to the continuous large arrivals for the past few months. Ordinary quality gum was quoted at the beginning of the month from 400 to 420 francs per 100 kilos, but quotations became weaker and market closed the end of the month at prices ranging between 300 and 420 francs per 100 kilos, according to quality. Gum arrivals from the Belgian Congo during March were estimated by the trade to be 977 tons as compared with 1,215 tons in February and 1,476 tons in January. Exports from Antwerp to the United States during March totaled 513,149 pounds, bringing the total for the first quarter of 1929 to 1,771,707 pounds. Out of the total of 8,084,272 pounds of copal gum imported into Antwerp from the Belgian Congo for the first quarter of this year, about 22 per cent. was shipped to the United States. Export statistics during the last three years of kauri gum from Auckland disclose a reduction in quantity. Comparative figures are as follows: 1926,—10,924,480 lbs., $1,617,238; 1927,—10,469,760 lbs., 1,354,152; 1928,—9,842,560 lbs., 1,167,076. Exports of gum are not segregated according to countries of destination but it is estimated that the United States takes substantially half of the gum export. The following figures compiled from consular invoices shows shipments made to the United States declined in 1927, but improved decidedly last year: 1926,—5,464,225 lbs., $792,349; 1927,—4,285,480 lbs., $601,313; 1928,—5,195,842 lbs., $727,537.

Hemlock Bark — New crop has now become available with quotations at $16.00 per ton.

Mercury — Business has been in fair volume during the past month and suffi-

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Chloride flake, 375 lb. drs c-l wks.....ton	.....	36.00	36.00	36.00
37.00	27.00	37.00	37.00	Important shipment....ton	.....	33.00	33.00	33.00
33.00	33.00	33.00	33.00	Fused, imp, 900 lb bbls NY ton	.....	31.00	31.00	31.00
31.00	31.00	31.00	31.00	Flucsilicate, crys, 400 lb bbls wks.....lb.	.10	.10½	.10½	.10
.10½	.10	.10	.10	Oxide, USP, light, 100 lb bbls .....lb.	.....	.42	.42	.42
.42	.42	.42	.42	Heavy, 250 lb bbls.....lb.	.....	.50	.50	.50
.50	.50	.50	.50	Peroxide, 100 lb cs.....lb.	.....	1.25	1.25	1.25
.....	.....	.....	.....	Silicofluoride, bbls.....lb.	.09½	.10½	.10½	.09½
.10½	.09½	.12½	.09½	Stearate, bbls.....lb.	.25	.26	.26	.25
.25	.23	.23	.23	Manganese Borate, 30%, 200 lb bbls.....lb.	.....	.19	.24	.19
.24	.24	.24	.24	Chloride, 600 lb casks.....lb.	.08	.08½	.08½	.08
.08½	.08	.08	.08	Dioxide, tech (peroxide) drs lb.	.04½	.06	.06	.04½
.....	.....	.05	.04½	Ore, powdered or granular				
.50	.35	.....	.....	75-80%, bbls.....lb.	.03	.03½	.03½	.03
.03½	.03	.03	.03	80-85%, bbls.....lb.	.04	.04½	.04½	.04
.04½	.04	.04	.04	85-88%, bbls.....lb.	.05	.05½	.05½	.05
.05½	.05	.05	.05	Sulfate, 550 lb drs NY.....lb.	.08	.08½	.08½	.08
.07½	.07	.07	.07	Mangrove 55%, 400 lb bbls..lb.	.03½	Nom.	Nom.	.03½
Nom.	.03½	.03½	.03½	Bark, African.....ton	.....	30.00	35.00	30.00
45.00	35.00	39.00	34.00	Marble Flour, bulk.....ton	14.00	15.00	15.00	14.00
12.00	10.00	10.00	10.00	Mercury metal.....75lb flask	.....	123.00	124.50	120.00
132.00	121.00	129.00	99.00	Meta-nitro-aniline.....lb.	.70	.72	.74	.70
.74	.72	.72	.72	Meta-nitro-para-toluidine 200 lb. bbls.....lb.	1.50	1.55	1.55	1.50
1.80	1.50	1.70	1.70	Meta-phenylene-diamine 300 lb. bbls.....lb.	.84	.90	.90	.84
.94	.90	.90	.90	Meta-toluene-diamine, 300 lb bbls.....lb.	.70	.72	.72	.70
.74	.72	.72	.72					
				Methanol				
				Methanol, (Wood Alcohol), drs 95%.....gal.	.58	.65	.65	.58
.58	.46	.80	.55	97%, drums c-l.....gal.	.60	.65	.65	.60
.60	.47	.87	.57	Pure, drums lc-l.....gal.	.65	.68	.68	.65
.63	.44	.....	.....	Synthetic, drums c-l.....gal.	.63	.66	.66	.63
.58	.48	.....	.....	Denat. gre. tanks.....gal.	.60	.62	.62	.60
.75	.45	.80	.75	Methyl Acetate, drums.....gal.	.....	.95	.95	.95
.95	.95	.95	.95	Acetone, 100 gal drums...gal.	.83	.85	.85	.83
.90	.68	.88	.75	Anthraquinone, kegs.....lb.	.85	.95	.95	.85
.95	.85	1.00	.85	Cellosolve, (See Ethylene Glycol Mono Methyl Ether)	.....	.....	.60	.55
.....	.....	.....	.....	Chloride, 90 lb cyl.....gal.	.55	.60	.....	.....
60	.55	.55	55	Furoate, tech., 50 gal. dr., .lb.	.....	.50	.50	.50
80.00	65.00	.03½	.03½	Mica, dry grd. bags wks.....lb.	65.00	80.00	80.00	65.00
115.00	110.00	.05½	.05½	Wet, ground, bags wks.....lb.	110.00	115.00	115.00	110.00
.....	.....	3.00	3.00	Michler's Ketone, kegs.....lb.	.....	3.00	3.00	3.00
.75	.70	.70	.70	Monochlorobenzene, drums see, Chorobenzene, mono.....lb.	.70	.75	.75	.70
1.05	1.05	1.05	1.05	Monoethylorthotoluidin, drs. lb.				
4.20	3.95	3.95	3.95	Monomethylaniline, 900 lb dr .....lb.	.....	1.05	1.05	1.05
.07	.06½	.06½	.06½	Monomethylparaminosufate 100 lb drums.....lb.	3.95	4.20	4.20	3.95
.04½	.04½	.04	.04	Montan Wax, crude, bags....lb.	.06½	.07	.07	.06½
.08½	.08	.08	.08	Myrobalans 25%, liq bbls....b	.04½	.04½	.04½	.04½
50.00	42.00	43.50	41.00	50% Solid, 50 lb boxes.....lb.	.08	.08½	.08½	.08
40.00	32.50	37.00	23.50	J1 bags.....ton	.....	42.00	43.00	40.00
40.00	32.50	37.00	30.00	J 2 bags.....ton	.....	29.00	40.00	29.00
.18	.18	.21	.18	R 2 bags.....ton	.....	29.00	34.00	29.00
.06	.05½	.06	.05½	Naphtha, v. m. & p. (deodorized) bbls.....gal.	.....	.16	.18	.16
.04½	.04½	.04½	.04½	Naphthalene balls, 250 lb bbls wks.....lb.	.....	.05½	.05½	.05½
.05	.05	.05	.04½	Crushed, chipped bgs wks..lb.	.....	.04½	.04½	.04½
.24	.21	.21	.21	Flakes, 175 lb bbls wks....lb.	.....	.05	.05	.05
.38	.35	.35	.35	Nickel Chloride, bbls kegs....lb.	.21	.24	.24	.21
.09½	.09	.09	.08½	Oxide, 100 lb kegs NY....lb.	.37	.40	.40	.37
.09	.08½	.08½	.08	Salt bbl. 400 bbls lb NY...lb.	.....	.13	.13	.13
1.30	1.25	1.25	1.10	Single, 400 lb bbls NY.....lb.	.....	.13	.13	.13
1.20	.98½	1.10	1.10	Nicotine, free 40%, 8 lb tins, cases.....lb.	1.25	1.30	1.30	1.25
14.00	13.00	13.00	13.00	Sulfate, 10 lb tins.....lb.	.98½	1.20	1.20	.98½
.10½	.10½	10½	.09½	Nitre Cake, bulk .....ton	16.00	18.00	18.00	12.00
Nom.	.40	.40	.40	Nitrobenzene, redistilled, 1000 lb drs wks.....lb.	.10½	.10½	.10½	.10½
Nom.	.55	.55	.55	Nitrocellulose, regular drums wks.....lb.	.40	Nom.	Nom.	.40
Nom.	.50	.50	.50	Low viscosity (soln only) Grade 1 drums, wks.....lb.	.55	Nom.	Nom.	.55
4.00	3.35	3.60	3.35	Grade 2 drums, wks.....lb.	.50	Nom.	Nom.	.50
.25	.25	.25	.25	Nitrogenous Material, bulk..unit	.....	3.75	4.00	3.75
.15	.14	.14	.14	Nitronaphthalene, 550 lb bbls.lb.	.....	.25	.25	.25
Nom.	.25	.25	.25	Nitrotoluene, 1000 lb drs wks.lb.	.14	.15	.15	.14
.18	.17	.17	.17	Nutgalls Aleppy, bags.....lb.	.16	.16½	.16½	.16
.24	.22	.22	.22	Chinese, bags.....lb.	.12	.13	.13	.12
.03½	.03½	.03½	.03½	Powdered, bags.....lb.	.22	.24	.24	.22
.04½	.04	.04	.04	Oak, tanks, wks.....lb.	.....	.03½	.03½	.03½
50.00	45.00	45.00	45.00	23-25% liq., 600 lb bbl wk lb.	.04	.04½	.04½	.04
23.00	20.00	20.00	20.00	Oak Bark, ground.....ton	30.00	35.00	50.00	30.00
.13½	.13	.14½	.13	Whole.....ton	20.00	23.00	23.00	20.00
2.25	2.20	2.20	2.20	Orange-Mineral, 1100 lb casks NY.....lb.	.12½	.13½	.13½	.12½
2.50	2.35	2.50	2.35	Orthoaminophenol, 50 lb kgs..lb.	2.20	2.25	2.25	2.20
.65	.50	.50	.50	Orthoanisidine, 100 lb drs....lb.	2.50	2.60	2.60	2.50
.28	.18	.18	.18	Orthochlorophenol, drums....lb.	.50	.65	.65	.50
.07	.06	.06	.06	Orthocresol, drums.....lb.	.18	.28	.28	.18
.35	.32	.32	.32	Orthodichlorobenzene, 1000 lb drums.....lb.	.07	.10	.10	.07
				Orthonitrochlorobenzene, 1200 lb drs wks.....lb.	30	.33	.33	.30

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - May 1929 $1.04

cient to hold prices steady at levels previously quoted. Domestic producers are again in the market and did most of the business during the month. Production of mercury in Italy during 1928 was 1,800 tons as compared with 1,996 tons in 1927. The value, however, increased from 71 million lire to 118 million lire. About a quarter of the total exports went to Germany, with England, France, and the United States as markets of subsidiary importance.

Methanol — Demand continues good, with prices firm and the market generally in excellent position. March production of crude methanol was 714,266 gallons, as compared with 676,672 gallons in February, and 707,460 gallons in March 1928.

Nitre Cake — Supplies of this material in bulk are at a premium due to the fact that much of the acid now produced eliminates this material as a by-product. Meantime there is considerable manufacture of the material in granulated form for cleaning purposes, and this grade is quoted at 3c @ 4c lb.

Phenol — Reports concerning the future of this material conflict, with some predicting an easing off of the situation within the next six weeks, while others seem to think that the present scarcity will only be aggravated by that time. Meantime demand continues heavy with spot supplies practically unavailable.

Phosphate Rock — The total quantity of phosphate rock exported from the United States during 1928 did not show any marked change (a decline of two per cent.) The decline of 28 per cent. in the tonnage of shipments of high-grade rock was practically offset by increased exports of land pebble. Shipments of land pebble were slightly more than two per cent. in excess of the 1927 figure. Exports of land pebble from the United States to Germany rose from 135,000 tons in 1927 to 167,000 in 1928; to Italy, from 87,000 to 96,000; and to Japan, from 131,000 to 181,000 tons. Shipments to Denmark, however, fell from 44,000 from 23,000 to 7,700, and to Cuba, from 21,000 to 12,000 tons. During the first quarter of 1929, exports of high grade phosphate rock amounted to 21,893 tons, as compared with 33,916 tons in the same period of 1928, and 48,182 tons in 1927. An especially noticeable gain occurred in the exports of land pebble during this period. Exports amounted to 237,481 tons in the first quarter of this year which compares with 157,194 tons, and 131,490 tons, in the similar period of 1928 and 1929 respectively.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Orthonitrotoluene, 1000 lb drs wk.....lb.	.17	.18	.18	.17
.18	.17	.13	.13	Orthonitrophenol, 350 lb dr...lb.	.85	.90	.90	.85
.90	.85	.85	.85	Orthotoluidine, 350 lb bbl 1c-1 lb.	.25	30	.30	.25
.31	.29	.29	.25	Orthonitroparachlorphenol, tins .....lb.	.70	.75	.75	.70
.75	.70	.70	.70	Osage Orange, crystals.....lb.	.16	.17	.17	.16
.17	.16	.16	.16	51 deg. liquid.....lb.	.07	.07½	.07½	.07
.07	.07	.07	.07	Powdered, 100 lb bags.....lb.	.14½	.15	.15	.14½
.15	.14½	.14½	.14½	Paraffin, refd, 200 lb cs slabs				
.06½	.06½	.06½	.06½	123-127 deg. M. P.....lb.	.06	.06½	.06½	.06½
.07½	.07½	.07½	.07½	128-132 deg. M. P.....lb.	.06½	.06½	.07	.06½
.08½	.08	.08	.08	133-137 deg. M. P.....lb.	.07½	.07½	.07½	.07½
.10	.08½	.08½	.08½	138-140 deg. M. P.....lb.	.08	.09	.09	.08
.28	.20½	.29	.26	Para Aldehyde, 110-55 gal drs..lb.	.20½	.23	.28	.20½
1.05	1.00	1.00	1.00	Aminoacetanilid, 100 lb bg..lb.	1.00	1.05	1.05	1.00
				Aminohydrochloride, 100 lb kegs.....lb.	1.25	1.30	1.30	1.25
1.30	1.25	1.25	1.25	Aminophenol, 100 lb kegs..lb.	.99	1.02	1.15	.99
1.15	1.15	1.15	1.15	Chlorophenol, drums.....lb.	.50	.65	.65	.50
.65	.50	.50	.50	Coumarone, 330 lb drums..lb.	.....	.....	.....	.....
.....	.....	.12	.12	Cymene, refd, 110 gal dr..gal.	2.25	2.50	2.50	2.25
2.50	2.25	2.25	2.25	Dichlorobenzene, 150 lb bbls wks.....lb.	.17	.20	.20	.17
				Nitroacetanilid, 300 lb bbls.lb.	.50	.55	.55	.50
.20	.17	.17	17	Nitroaniline, 300 lb bbls wks .....lb.	.48	.59	.49	.48
.55	.50	.53	.50	Nitrochlorobenzene, 1200 lb drs wks.....lb.	.23	.26	.26	23
.59	.48	.52	.52	Nitro-orthotoluidine, 300 lb bbls.....lb.	2.75	2.85	2.85	2.75
.32	.32	.32	.32	Nitrophenol 185 lb bbls....lb.	.50	.55	.55	.50
2.85	2.75	2.75	2.75	Nitrosodimethylaniline, 120 lb. bbls.....lb.	.92	.94	.94	.92
.55	.50	.50	.50	Nitrotoluene, 350 lb bbls....lb.	.....	.30	.30	.30
.94	.92	.92	.92	Phenylenediamine, 350 lb bbls .....lb.	1.15	1.20	1.20	1.15
.30	.30	.30	.25	Toluenesulfonamide, 175 lb bbls.....lb.	.70	.75	.75	.70
1.20	1.15	1.20	1.15	Toluenesulfonchloride, 410 lb bbls wks.....lb.	.20	.22	.22	.20
.41	.40	.40	.40	Toluidine, 350 lb bbls wk...lb.	.40	.42	.42	.40
.22	.20	.20	.18	Paris Green, Arsenic Basis				
.42	.40	.45	.38	100 lb kegs.....lb.	.....	.27	.27	.25
.25	20	.21	.21	250 lb kegs.....lb.	.....	.25	.25	.23
.23	.17	.19	.19	Persian Berry Ext., bbls.....lb.	.25	Nom.	.25	.25
.....	.....	.25	.25	Petrolatum, Green, 300 lb bbl.lb.	.02	.02½	.02½	.02
.03	.02½	.02½	.02½	Phenol, 250-100 lb drums.....lb.	.13½	.16	.16	.13½
.13	.20	.18	.16	Phenyl - Alpha - Naphthylamine, 100 lb kegs.....lb.	.....	1.35	1.35	1.35
1.35	1.3.	1.35	1.28					

Phosphate

				Phosphate Acid (see Superphosphate)			
				Phosphate Rock, f.o.b. mines			
3.15	3.00	3.00	3.00	Florida Pebble, 68% basis..ton	3.00	3.15	3.15	3.00
3.65	3.50	3.50	3.50	70% basis.....ton	3.75	4.00	4.00	3.50
4.15	4.00	4.00	3.85	72% basis.....ton	4.25	4.50	4.50	4.00
5.00	5.00	5.35	5.00	75-74% basis.....ton	5.25	5.50	5.50	5.00
5.75	5.75	5.75	5.60	75% basis.....ton	.....	5.75	5.75	5.75
6.25	6.25	6.25	6.00	77-76% basis.....ton	.....	6.25	6.25	6.25
5.00	5.00	5.50	5.00	Tennessee, 72% basis.....ton	.....	5.00	5.00	5.00
				Phosphorous Oxychloride 175 lb				
.40	.35	.35	.35	cyl.....lb.	.35	.40	.40	.35
.65	.60	.65	.60	Red, 110 lb cases.....lb.	.55	.60	.60	.55
.32	.32	.32	.32	Yellow, 110 lb cases wks..lb.	.....	.32	.32	.32
.46	.46	.46	.46	Sesquisulfide, 100 lb cs.....lb.	.....	.44	.46	.44
.....	.....	.35	.35	Trichloride, cylinders.....lb.	.....	.35	.35	.35
				Phthalic Anhydride, 100 lb bbls				
.20	.18	.18	.18	wks.....lb.	.18	.20	.20	.18
				Pigments Metallic, Red or brown				
45.00	37.00	40 00	37.00	bags, bbls, Pa. wks.....ton	37.00	45.00	45.00	37.00
				Pine Oil, 55 gal drums or bbls				
.64	.63	.63	.63	Destructive dist.....lb.	.63	.64	.64	.63
10.60	8.00	8.00	8.00	Prime bbls.....bbl.	8.00	10.60	10.60	8.00
.70	.70	.70	.66	Steam dist. bbls.....gal.	.65	.70	.70	.65
				Pitch Hardwood, wks.....ton	40.00	45.00	45.00	40.00
45.00	40.00	40.00	40.00					
				Plaster Paris, tech, 250 lb bbls				
3.30	3.30	3.30	3.30	.....bbl.	3.30	3.50	3.50	3.30

Potash

.07½	.07½	.07½	.07½	Potash, Caustic, wks.....lb.	.....	.07½	.07½	.07½
.07½	.07½	.07½	.07½	Imported casks c-1.....lb.	.....	.07½	.07½	.07½
				Potash Salts, Rough Kainit				
9.00	9.00	9.00	9.00	12.4% basis bulk.....ton	.....	9.10	9.10	9.00
9.50	9.50	9.50	9.50	14% basis.....ton	.....	9.60	9.60	9.50
				Manure Salts.....				
12.40	12.40	12.40	12.40	20% basis bulk.....ton	.....	12.50	12.50	12.40
18.75	18.75	18.75	18.75	30% basis bulk.....ton	.....	18.95	18.95	18.75
				Potassium Muriate, 80% basis				
36.40	36.40	36.40	36.40	bags.....ton	.....	36.75	36.75	36.40
				Pot. & Mag. Sulfate, 48% basis				
27.00	27.00	27.00	27.00	bags.....ton	.....	27.50	27.50	27.00
				Potassium Sulfate, 90% basis				
47.30	47.30	47.30	47.30	bags.....ton	.....	47.75	47.75	47.30
				Potassium Bicarbonate, USP, 320				
.09½	.09	.09	.09	lb bbls.....lb.	.13	.14	.14	.13
				Bichromate Crystals, 725 lb				
.09½	.08½	.08½	.08	casks.....lb.	.09	.09½	.09½	.09
.12½	.12	.12	.11	Powd., 725 lb cks wks....lb.	.13	.13½	.13½	.13

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - May 1929 $1.04

Potash — Potash produced in the United States in 1928 amounted to 104,129 short tons of potassium salts containing 59,910 short tons of potash (K2O), it was stated on May 13 by the Bureau of Mines, Department of Commerce. Sales by producers amounted to 105,208 tons of potassium salts containing 60,370 tons of K2O. The potash materials of domestic origin, sold by producers in 1928, were valued at $3,029,422 f. o. b. plants. About 6,260 tons of potassium salts, with an available content of 2,100 tons of K2O, remained in producers' stocks December 31, 1928. The output increased 35.5 per cent. in gross weight, with an increase of 38 per cent. of K2O content.

Rosin — Some slight improvement in market conditions has been noticeable and as a result prices range to about 20c per unit higher according to grade. Demand has been much better and only the fact that a rather large crop is in sight has kept prices as low as they are.

Salt Cake — Some scarcity continues to be prevalent in this market and with added production costs a price advance seems imminent.

Shellac — The past month has witnessed a consistent improvement in this market despite the fact that there has been but little buying interest shown here. Nevertheless, the market is very steady and prices have advanced on all grades so that bone dry is now at 58c lb., garnet at 45c lb., superfine at 47c lb., and T. N. at 43c lb. Heavy buying is reported from Calcutta, and the steady conditions here may doubtless be attributed to that fact.

Soda Ash — That industry generally is in excellent condition is indicated by the volume of business being done by producers of this alkali, whose sales have now reached totals far exceeding the most optimistic forecasts.

Soda Caustic — This alkali is also in excellent condition and far ahead of last year in volume of business. In some sections there has been even some shortage noticeable, even though some curtailment of textile activity in the South affected consumption to some degree. The only discordant note comes from the West coast, where although demand is good, local production features have injected some degree of instability into the market.

Sodium Nitrate — Although not in particularly good condition, remains the firmest of the fertilizer group. Chief interest is centered on the activities of the Chilean delegation which is now in Europe and from which an announcement regarding next year's values is expected soon. Production during April amounted to

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.17	.16	.16	.16	Binoxiate, 300 lb bbls.....lb.	.16	.17	.17	.16
.30	.30	.30	.30	Bisulfate, 100 lb kegs.....lb.	.....	.30	.30	.30
.05½	.05½	.05½	.05½	Carbonate, 80-85% calc. 800 lb casks.....lb.	.05½	.05½	.05½	.05½
.09	.06½	.08½	.08½	Chlorate crystals, powder 112 lb keg wks.....lb.	.08½	.09	.09	.08½
.08½	.07½	.08½	.08½	Imported 112 lb kegs NY.....lb..	.07½	.07½	.07½	.07½
.05½	.05½	.05½	.05½	Chloride, crys bbls.....lb.	.05½	.05½	.05½	.05½
.28	.27	.27	.27	Chromate, kegs.....lb.	.27	.28	.28	.27
.57½	.55	.55	.55	Cyanide, 110 lb. cases.....lb.	.55	.57½	.57½	.55
.12	.11½	.11½	.11½	Metabisulfite, 300 lb. bbl...lb.	.12	.13	.13	.11½
.17	.16	.16	.16	Oxalate, bbls.....lb.	.20	.24	.24	.16
.12	.11	.11	.11	Perchlorate, casks wks.....lb.	.11	.12	.12	.11
.15½	.15	.15½	.14½	Permanganate, USP, crys 500 & 100 lb drs wks.....lb.	.16	.16½	.16½	.16
.38	.37	.39	.37½	Prussiate, red, 112 lb keg...lb.	.38	.40	.40	.38
.18½	.18	.18	.18	Yellow, 500 lb casks.....lb.	.18½	.21	.21	.18½
.51	.51	.51	.51	Tartrate Neut, 100 lb keg..lb.	.....	.21	.51	.51
.25	.25	.25	.25	Titanium Oxalate, 200 lb bbls .....lb.	.21	.23	.25	.21
.....	.....	.....	.....	Propyl Furoate, 1 lb tins.....lb.	.....	5.00	5.00	5.00
.05	.04	.04	.04	Pumice Stone, lump bags.....lb.	.04	.05	.05	.04
.06	.04½	.04½	.04½	250 lb bbls.....lb.	.04½	.06	.06	.04½
.03	.02½	.02½	.02½	Powdered, 350 lb bags.....lb.	.02½	.03	.03	.02½
.03½	.03½	3.75	3.75	Putty, commercial, tubs..100 lb.	.....	.03½	.03½	.03½
.05½	.05½	5.50	5.50	Linseed Oil, kegs.....100 lb.	.....	.05½	.05½	.05½
1.50	1.50	3.00	1.50	Pyridine, 50 gal drums.....gal.	.....	1.75	1.75	1.50
.13½	.13	.13	.12	Pyrites, Spanish cif Atlantic ports bulk.....unit	.13	.13½	.13½	.13
.04	.03	.03	.03	Quebracho, 35% liquid tks....lb.	.03½	.04	.04	.03½
.04½	.03½	.03½	.03½	450 lb bbls c-1.....lb.	.03½	.04½	.04½	.03½
.05½	.04	.04	.04	35% Bleaching, 450 lb bbl .lb.	.04½	.05½	.04½	.05½
.05½	.05	.05	.04½	Solid, 63%, 100 lb bales cif..lb.	.05½	.05½	.05½	.05½
.05½	.05	.05	.05	Clarified, 64%, bales.....lb.	.....	.05½	.05½	.05½
.06	.05½	.06½	.06½	Quercitron, 51 deg liquid 450 lb bbls.....lb.	.05½	.06	.06	.05½
.13	.10	.10	.10	Solid, 100 lb boxes.....lb.	.10	.13	.13	.10
14.00	14.00	14.00	14.00	Bark, Rough.....ton	.....	14.00	14.00	14.00
35.00	34.00	34.00	34.00	Ground.....ton	34.00	35.00	35.00	34.00
.46	.45	.45	.45	R Salt, 250 lb bbls wks.....lb.	.45	.46	.46	.45
.....	.....	.18	.18	Red Sanders Wood, grd bbls..lb.	.....	.18	.18	.18
1.35	1.25	1.25	1.25	Resorcinol Tech, cans.....lb.	1.15	1.25	1.25	1.15
.57	.57	.67	.57	Rosin Oil, 50 gal bbls, first run .....gal.	.....	.62	.62	.57
.62	.62	72	.62	Second run.....gal.	.....	.64	.34	.62
				Rosin				
9.75	8.20	13.00	8.50	Rosins 600 lb bbls 280 lb...unit B.....	.....	7.65	8.30	7.45
9.80	8.25	13.00	8.50	D.....	.....	7.75	8.65	7.70
9.95	8.60	13.15	8.50	E.....	.....	8.35	9.10	8.35
10.10	8.65	13.20	8.50	F.....	.....	8.45	9.30	8.45
10.10	8.75	13.25	8.50	G.....	.....	8.45	9.45	8.45
10.10	8.75	13.30	8.50	H.....	.....	8.45	9.50	8.50
10.15	8.80	13.35	8.55	I.....	.....	8.45	9.50	8.50
10.15	8.85	14.80	8.65	K.....	.....	8.50	9.55	8.55
10.30	8.85	15.00	8.80	M.....	.....	8.50	9.85	8.55
11.00	9.15	15.85	9.15	N.....	.. ..	9.20	10.30	9.10
11.65	10.15	16.60	10.50	WG.....	.....	9.45	11.30	9.45
12.65	10.40	18.55	12.00	WW.....	.....	10.05	12.30	9.95
30.00	24.00	24.00	24.00	Rotten Stone, bags mines....ton	24.00	30.00	30.00	24.00
.08	.07	.07	.07	Lump, imported, bbls.....lb.	.07	.08	.08	.07
.12	.09	.09	.09	Selected bbls.....lb.	.09	.12	.12	.09
.05	.02	.02	.02	Powdered, bbls.....lb.	.02	.05	.05	.02
.05	.04½	.04½	.04½	Sago Flour, 150 lb bags.....lb.	.04½	.05	.05	.04½
.....	.....	.90	.90	Sal Soda, bbls wks.....100 lb.	.....	1.00	1.00	1.00
20.00	19.00	19.00	19.00	Salt Cake, 94-96% c-1 wks. .ton	19.00	20.00	20.00	19.00
17.00	15.00	15.00	15.00	Chrome .....ton	12.00	15.00	17.00	12.00
.06½	.06½	.06½	.06½	Saltpetre, double refd granular 450-500 lb bbls.....lb.	.06½	.06½	.06½	.06½
.01½	.01½	.01½	.01½	Satin, White, 500 lb bbls.....lb	.....	.01½	.01½	.01½
.62½	.49	.66	.47	Shellac Bone dry bbl.....lb.	.....	.58	.61	.55
.55	.45	.57	.41	Garnet, bags.....lb.	.. ..	.45	.45	.43
.58	.47	.65	40	Superfine, bags.....lb.	.....	.47	.47	.45
.55	.42	.37	.57	T. N. bags.....lb.	.....	.43	.44	.41
.57	.53	.50	.50	Schaeffer's Salt, kegs.....lb.	.53	.57	.57	.53
11.00	8.00	6.00	6.00	Silica, Crude, bulk mines....ton	8.00	11.00	11.00	8.00
30.00	22.00	15.00	15.00	Refined, floated bags.....ton	22.00	30.00	30.00	22.00
.....	.....	32.00	32.00	Air floated bags.....ton	.....	32.00	32.00	32.00
40.00	32.00	55.00	55.00	Extra floated bags.....ton	32.00	40.00	40.00	32.00
22.00	15.00	15.00	15.00	Soapstone, Powdered, bags f. o. b. mines.....ton	15.00	22.00	22.00	15.00
				Soda				
1.40	1.40	1.32½	1.32½	Soda Ash, 58% dense, bags c-1 wks.....100 lb.	.....	1.40	1.40	1.4
2.29	2.40	2.14	2.04	58% light, bags.....100 lb.	.....	1.34½	1.34½	1.34½
1.32½	1.32½	1.32½	1.32½	Contract, bags c-1 wks.100 lb.	.....	1.32	1.32	1.32
4.21	4.16	4.16	4.06	Soda Caustic, 76% grnd & flake drums.....100 lb.	.....	3.35	3.35	3.35
3.91	3.76	3.76	3.66	76% solid drs.....100 lb.	.....	2.95	2.95	2.95
3.00	3.00	3.00	3.00	Contract, c-1 wks.....100 lb.	.....	2.90	2.90	2.90
.05	.04½	.04½	.04½	Sodium Acetate, crystals, 450 lb. bbls wks.....lb.	.05¼	.06¼	.06¼	.05
.....	.....	.19	.18	Arsenate, drums.....lb.	.18	.19	.19	.18
.....	.....	1.00	1.00	Arsenite, drums.....gal.	1.00	1.50	1.50	1.00
2.41	2.41	2.41	2.41	Bicarb, 400 lb bbl NY..100 lb.	.....	2.41	2.41	2.41

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - May 1929 $1.04

266,959 tons, against 251,063 tons in April, 1928. Shipments during April were as follows: 136,000 tons to the United States; 68,000 tons to Europe; 6,700 tons to Japan; 6,700 tons to Hawaii; and 800 tons to various other places.

Superphosphate — Production of bulk superphosphate during March, as reported to the Department of Commerce by 80 concerns operating 172 plants, was 339,800 tons, as compared with 334,776 tons during February. Although the superphosphate exports of 88,600 tons in 1928 were approximately 18 per cent. lower than in the previous year it must be borne in mind that the shipment of 107,500 tons in 1927 constituted a peak in the United States superphosphate trade. With the exception of 1927, the 1928 exports of superphosphate exceeded those of any previous year.

Toluene — Both this material and xylene are reported to be in excellent demand and in conditions approaching shortage in some sections of the country, where holders of spot stocks are exacting premiums for delivery.

Turpentine — Although demand has improved somewhat, the prospect of a large crop has kept prices at about the same level as when last reported.

OILS AND FATS

Chinawood Oil — There has been but comparatively little trading in this oil during the past month. Prices, however, have been well maintained chiefly because of the lack of buying interest. Total April exports from Hankow were 7,694,160 pounds, of which 6,722,000 pounds were shipped to the United States and 972,160 pounds to Europe. Stocks of oil at Hankow at the end of April were estimated at approximately 3,500 short tons. According to these figures there was a gain in exports during April as compared with March and with April, 1928. Exports during March were 7,070,560 pounds, of which 6,076,000 pounds went to the United States; while exports during April, 1928 were 7,482,090 pounds, of which 6,573,875 came to the United States. Total quantity for the first four months of this year was also larger than same period of 1928, being 32,352,435 pounds, of which 27,877,465 pounds went to the United States, as compared with 29,347,010 pounds, of which 24,736,635 pounds went to the United States in January-April, 1928.

Coconut Oil — Little or no activity has been evidenced in this market during

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.07	.06¾	.06¾	.06¾	Bichromate, 500 lb cks wks..lb.	.07¼	.07¼	.07¼
.04	.04	.08¼	.08¼	Bisulfite, 500 lb bbl wks....lb.	.....	.04	.04
1.35	1.30	1.30	1.30	Carb. 350 lb bbls NY..100 lb.	1.30	1.35	1.35
.06¾	.05¾	.06¾	.06¾	Chlorate, 112 lb kegs wks..lb.	.06¼	.07	.07
13.00	12.00	12.00	12.00	Chloride, technical.....ton	12.00	13.00	13.00
.20	.20	.20	.20	Cyanide, 96-98%, 100 & 250 lb drums wks.....lb.	.18	.20	.20
.09	.08¼	.08¼	.08¼	Fluoride, 300 lb bbls wks...lb.	.08¼	.09	.09
.24	.22	.22	.22	Hydrosulfite, 200 lb bbls f. o. b. wks.....lb.	.22	.24	.24
.05	.05	.05	.05	Hypochloride solution, 100 lb cbys.....lb.	.....	.05	.05
3.05	2.65	2.65	2.65	Hyposulfite, tech, pea cyrs 375 lb bbls wks.....100 lb.	2.65	3.05	3.05
2.65	2.40	2.40	2.40	Technical, regular crystals 375 lb bbls wks....100 lb.	2.40	2.65	2.65
.45	.45	.70	.45	Metanilate, 150 lb bbls.... lb.	.....	.45	.45
.....	.....	.02½	.02½	Monohydrate, bbls.....lb.	.....	.02½	.02½
.57	.55	.55	.55	Naphthionate, 300 lb bbl...lb.	.55	.57	.57
2.45	2.12½	2.67	2.25	Nitrate, 92%, crude, 200 lb bags c-1 NY.....100 lb.	.....	2.22½	2.22½
.08¼	.07½	.08¼	.08	Nitrite, 500 lb bbls spot....lb.	.07½	.08	.08
.27	.25	.25	.25	Orthochlorotoluene, sulfonate, 175 lb bbls wks.....lb.	.25	.27	.27
.23	.20	.20	.20	Oxalate Neut, 100 lb kegs..lb.	.37	.42	.42
3.90	3.90	3.90	3.90	Paratoluene, tri-sodium, tech. 100 lb bbls c-1....100 lb.	.....	3.90	3.90
.09	.08	.08	.08	Sulfonate, 175 lb bbls....lb.	.08	.09	.09
.22	.21	.21	.21	Perborate, 275 lb bbls.....lb.	.18	.20	.22
3.55	3.25	3.25	3.25	Phosphate, di-sodium, tech. 310 lb bbls.....100 lb.	3.25	3.55	3.55
.....	.....	.....	.....	tri-sodium, tech, 325 lb bbls.....100 lb.	3.90	4.00	4.00
.72	.69	.69	.69	Picramate, 100 lb kegs.....lb.	.69	.72	.72
.12½	.12	.12	.11	Prussiate, Yellow, 350 lb bbl wks.....lb.	.12	.12½	.12½
.14	.13½	.13½	.13½	Pyrophosphate, 100 lb keg..lb.	.15	.20	.20
1.45	1.20	1.20	1.20	Silicate, 60 deg 55 gal drs, wks .....100 lb.	.....	1.65	1.65
1.10	.85	.85	.85	40 deg 55 gal drs, wks .....100 lb.	.70	.80	.80
.05	.05	.04½	.04½	Silicofluoride, 450 lb bbls NY .....lb.	.05½	.05½	.05½
.49	.48½	.48½	.48½	Stannate, 100 lb drums....lb.	.41½	.42	.43
.29	.18	.20	.20	Stearate, bbls.....lb.	.25	29	.29
.18	.16	.16	.16	Sulfanilate, 400 lb bbls.....lb.	.16	.18	.18
.02½	.02½	.02½	.02½	Sulfate Anhyd, 550 lb bbls c-1 wks.....lb.	.02½	.02½	.02½
.02½	.02½	.02½	.02½	Sulfide, 30% crystals, 440 lb bbls wks.....lb.	.02½	.02½	.02½
.04	.03½	.03½	03½	62% solid, 650 lb drums 1c-1 wks.....lb.	.03½	.04	.04
.03½	.03½	.03½	.03½	Sulfite, crystals, 400 lb bbls wks.....lb.	.03½	.03½	.03½
.50	.40	.40	.40	Sulfocyanide, bbls.....lb.	.66	.76	.76
.85	.80	.85	.80	Tungsten, tech, crystals, kegs .....lb.	.80	.85	.85
.40	.35	.40	.35	Solvent Naphtha, 110 gal drs wks.....gal.	.35	.40	.40
.01½	.01½	.01½	.01½	Spruce, 25% liquid, bbls.....lb.	.....	.01½	.01½
.01	.01	.01	.01	25% liquid, tanks wks.....lb.	.....	.01	.01
.02½	.02	.02	.02	50% powd, 100 lb bag wks lb.	.02	.02½	.02½
4.42	3.07	3.22	3.07	Starch, powd., 140 lb bags .....100 lb.	3.82	4.02	4.02
4.32	2.97	3.12	2.97	Pearl, 140 lb bags.....100 lb.	3.72	3.92	3.92
.06½	.05½	.06	.04½	Potato, 200 lb bags.....lb.	.05½	.06½	.06½
.06½	.05½	.06½	.06½	Imported bags.....lb.	.05½	.06½	.06½
.08½	.08	.08	.06	Soluble.....lb.	.08	.08½	.08½
.10	.09½	.09½	.09	Rice, 200 lb bbls.....lb.	.09½	.10	.10
.07	.06½	.06½	.06½	Wheat, thick bags.....lb.	.06½	.07	.07
.10	.09½	.09½	.09½	Thin bags.....lb.	.09½	.10	.10
.07½	.07½	.07½	.07½	Strontium carbonate, 600 lb bbls wks.....lb.	.07½	.07½	.07½
.09	.08½	.08½	.08	Nitrate, 600 lb bbls NY....lb.	.09	.09½	.09½
.....	.....	.....	.....	Peroxide, 100 lb drs.....lb.	.....	1.25	1.25
				Sulfur			
2.05	2.05	2.05	2.05	Sulfur Brimstone, broken rock, 250 lb bag c-1.....100 lb.	.....	2.05	2.05
19.00	18.00	18.00	18.00	Crude, f. o. b. mines.....ton	18.00	19.00	19.00
2.40	2.40	2.40	2.40	Flour for dusting 99½%, 100 lb bags c-1 NY....100 lb.	.....	2.40	2.40
2.50	2.50	2.50	2.50	Heavy bags c-1.....100 lb.	.....	2.50	2.50
3.45	3.45	3.45	3.45	Flowers, 100%, 155 lb bbls c-1 NY.....100 lb.	.....	3.45	3.45
2.85	2.65	2.65	2.65	Roll, bbls 1c-1 NY.....100 lb.	2.65	2.85	2.85
.05½	.05	.05	.05	Sulfur Chloride, red, 700 lb drs wks.....lb.	.05	.05½	.05½
.04½	.03½	.03¾	.03½	Yellow, 700 lb drs wks.....lb.	.03½	.04½	.04½
.08½	.08	.08	.08	Sulfur Dioxide, 150 lb cyl....lb.	.08	.08½	.08½
.19	.17	.17	.17	Extra, dry, 100 lb cyl.....lb.	.17	.19	.19
.65	.10	.65	.65	Sulfuryl Chloride, 600 lb dr...lb.	.10	.65	.65
.11½	.11	.11	.11	Stainless, 600 lb bbls....lb.	.11	.11½	.11½
.06	.05½	.05	.05	Extract, 450 lb bbls.....lb.	.05½	.06	.06
130.00	130.00	130.00	130.00	Sicily Leaves, 100 lb bg...ton	.....	130.00	130.00
72.00	72.00	80.00	72.00	Ground shipment.....ton	.....	72.00	72.00
60.00	55.00	55.00	55.00	Virginia, 150 lb bags.....ton	55.00	60.00	60.00
15.00	12.00	12.00	12.00	Talc, Crude, 100 lb bgs NY...ton	12.00	15.00	15.00
18.00	16.00	16.00	16.00	Refined, 100 lb bgs NY..ton	16.00	18.00	18.00
35.00	30.00	30.00	30.00	French, 220 lb bags NY...ton	20.00	25.00	25.00
45.00	38.00	38.00	38.00	Refined, white, bags....ton	38.00	45.00	45.00
50.00	40.00	40.00	40.00	Italian, 220 lb bags NY...ton	40.00	50.00	50.00
55.00	50.00	50.00	50.00	Refined, white, bags....ton	50.00	55.00	55.00
				Superphosphate, 16% bulk, wks..... ton	.....	10.00	10.00

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - May 1929 $1.04

the past month and as a result, all grades are about 1c lb. lower than when previously quoted. The low prevailing prices on coconut oil are said to be chiefly responsible for the dull copra market in Manila. The market there is reported by the Department of Commerce, to be very irregular with many mills operating sporadically on old contracts. The market followed a downward course during the past month with Manilla arrivals amounting to 224,000 bags, or 72,000 over the same month last year. Heavy shipments of copra and coconut oil from the Philippines were responsible for the export total of 62,877,000 pesos recorded for the first two months of 1929, an increase of 2,300,000 pesos over the same period last year. Imports during the month totaled 48,037,000 pesos, an increase of 7,500,000 pesos. An increase of 65 per cent. in quantity and five per cent. in value was recorded in the coconut oil and copra shipments.

Cottonseed Oil — The characteristic tone of the market during the past month has been one of weakness, with but little trading carried on. PSY on spot is consequently 0.40c per pound lower than when last quoted. Futures are also quoted at a correspondingly lower figure. Trading in crude has practically ceased for the time being. Cottonseed crushed from August 1 to April 30 last, totaled 4,831,611 tons, against 4,516,591 tons for the corresponding period a year ago, according to figures compiled by the United States Census Bureau. Receipts of cottonseed at mills during the period totaled 5,004,626 tons, against 4,535,151 tons a year ago, and stocks on hand at mills April 30 aggregated 191,048 tons, against 107,844 tons on the same date in 1928. Production: Crude oil, 1,523,553,552 pounds; refined, 1,328,809,151 pounds; cake and meal, 2,176,222 tons; hulls, 1,307,549 tons; linters, 1,030,890 bales; hull fiber, 66,391 bales. Stocks on hand, April 30: Seed (at plants), 191,048 tons; crude oil, 80,862,661 pounds; refined, 570,889,251 pounds. Exports of cottonseed for the eight months ended with March included 18,045,517 pounds of crude oil, against 43,133,802 pounds last year; 6,350,184 pounds of refined oil, against 7,084,676 pounds; 259,560 tons of cake and meal, against 295,814 tons, and 133,808 running bales of linters, against 138,379 bales.

Linseed Oil — Following the first news of the increase in tariff rate on flaxseed, buying activity increased tremendoulsy and prices advanced in conjunction with the demand. By the end of the month, however, conditions had about returned to normal and prices with them.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
5.10&10	4.65&10	4.85	4.00	Tankage Ground NY.....unit	.....	4.25&10	4.75&10	4.25&10
4.80&10	3.90&10	5.25	3.75	High grade f.o.b. Chicago.unit	.....	3.75&10	4.80&10	3.75&10
5.00&10	4.60&10	5.25	4.00	South American cif.....unit	.....	4.50&10	4.80&10	4.50&10
.05	.04½	.04½	.04½	Tapioca Flour, high grade bgs.lb.	.04½	.05	.05	.04½
.04	.03¾	.03¾	.03½	Medium grade, bags.....lb.	.03¾	.04	.04	.03¾
.27	.26	.26	.26	Tar Acid Oil, 15%,drums....gal.	.26	.27	.27	.26
.30	.29	.29	.29	25% drums.....gal.	.29	.30	.30	.29
.08	.07	.07	.07	Coke Oven, tanks wks.....lb.	.07	.08	.08	.07
13.50	13.50	16.00	13.50	Kiln Burnt, bbl.....bbl.	.....	13.50	13.50	13.50
15.00	13.50	18.50	13.50	Retort, bbls.....bbl.	13.50	15.00	15.00	13.50
1.75	1.15	1.15	1.15	Terra Alba Amer. No. 1, bgs or bbls mills.....100 lb.	1.15	1.75	1.75	1.15
2.00	1.50	1.50	1.50	No. 2 bags or bbls...100 lb	1.50	2.00	2.00	1.50
.02½	.02	2.00	2.00	Imported bags.....100 lb	.02	.02½	.02½	.02
.....	.....	.....	.....	Tetrachlorethane, 50 gal dr...lb	.09	.09½	.09½	.09
.20	.20	.20	.20	Tetralene, 50 gal drs wks.....lb	.....	.20	.20	.20
.24	.22	.22	.22	Thiocarbanilid, 170 lb bbl....lb.	.22	.24	.24	.22
.17½	.14½	.20½	.17½	Tin Bichloride, 50% soln, 100 lb bbls wks.....lb.	.....	.14	.14½	.14
.41½	.36½	.48	.41½	Crystals, 500 lb bbls wks...lb.	.....	.34½	.36½	.34½
.58	.48	.71½	.58	Metal Straits NY.....lb.	.....	.43⅜	.48	.43⅜
.75	53	.75	.70	Oxide, 300 lb bbls wks.....lb.	.....	.49	.56	.49
.35½	.30½	.48	.35½	Tetrachloride, 100 lb drs wks. .....lb.	.....	.28½	.30½	.28½
.40	.40	.40	.40	Titanium Oxide300 lb bbl....lb.	.....	.24	.40	.24
.14	.13½	.13½	.13½	Pigment, bbls.....lb.	.09½	.10	.14	.09½
.45	40	.40	.40	Toluene, 110 gal drs.....gal.	.....	.45	.45	.45
.45	.35	.35	.35	8000 gal tank cars wks....gal.	.....	.40	.40	.40
.94	.90	.90	.90	Toluidine, 350 lb bbls.....lb.	.90	.94	.94	.90
.32	.31	.31	.31	Mixed, 900 lb drs wks.....lb.	.31	.32	.32	.31
.90	.85	.85	.85	Toner Lithol, red, bbls.....lb.	.90	.95	.95	.85
.80	.70	.75	.75	Para, red, bbls.....lb.	.75	.80	.80	.70
1.80	1.70	1.75	1.75	Toluidine.....lb.	1.50	1.55	1.55	1.50
3.90	3.60	3.60	3.60	Triacetin, 50 gal drs wks.....lb.	3.60	3.90	3.90	3.60
.....	.....	.....	.....	Trichlorethylene, 50 gal dr...lb.	.10	.10½		
.....	.....	.....	.....	Triethanolamine, 50 gal drs...lb.	.55	.60	.60	.55
.50	.36	.36	.36	Tricresyl Phosphate, drs.....lb.	.33	.45	.45	.33
.73	.69	.70	.69	Triphenylguanidine.....lb.	.58	.60	.70	.58
.75	.70	.70	.70	Phosphate, drums.....lb.	.70	.75	.75	.70
3.00	2.50	2.50	2.50	Tripoli, 500 lb bbls.....100 lb.	1.75	2.00	2.00	1.75
.66½	.50½	.86	.53½	Turpentine Spirits, bbls.....gal.	.53½	.59	.65	.53½
.59	.46	.76	.46	Wood Steam dist. bbls....gal.	.....	.51	.57	.50
.20	.18	.18	.18	Urea, pure, 112 lb cases.....lb.	.20	.30	.30	.20
				Fert. grade, bags.....ton	.....	165.00	165.00	165.00
				c. i. f. S. points.....ton	.....	108.15	108.15	108.15
76.00	55.00	70.00	66.00	Valonia Beard, 42%, tannin bags.....ton	.....	50.00	55.00	50.00
55.00	58.00	49.50	39.00	Cups, 30-31% tannin.....ton	.....	31.00	35.00	31.00
64.00	45.00	68.00	43.00	Mixture, bark, bags.....ton	.....	37.00	43.00	37.00
2.10	1.75	1.95	1.55	Vermillion, English, kegs....lb.	2.00	2.05	2.05	2.00
.....	.....	.....	.....	Vinyl Chloride, 16 lb cyl.....lb.	.....	1.00	1.00	1.00
76.00	49.75	59.00	49.50	Wattle Bark, bags.....ton	43.50	45.00	49.75	43.50
.06½	.05¼	.05¼	.05¼	Extract 55%, double bags ex-dock.....lb.	.....	.06½	.06½	.06½
1.25	1.25	1.25	1.25	Whiting, 200 lb bags, c-1 wks .....100 lb.	.....	1.25	1.25	1.25
13.00	13.00	13.00	13.00	Alba, bags c-1 NY.....ton	.....	13.00	13.00	13.00
1.35	1.35	1.35	1.35	Gilders, bags c-1 NY...100 lb.	.....	1.35	1.35	1.35

Zinc

.05¼	5.85	.06¼	.06¼	Zinc Ammonium Chloride powd., 400 lb bbls.....lb.	5.25	5.75	5.75	5.25
.10	.09½	.09½	.09½	Carbonate Tech, bbls NY..lb.	.10½	.11	.11	.10½
.06	.06	.06	.06	Chloride Fused, 600 lb drs. wks.....lb.	.05¾	.06	.06	.05¾
.06¼	.06¼	.06¼	.06¼	Gran., 500 lb bbls wks.....lb.	.06¼	.06¼	.06¼	.06¼
3.00	3.00	3.00	3.00	Soln 50%, tanks wks...100 lb.	.....	3.00	3.00	3.00
.41	.40	.40	.40	Cyanide, 100 lb drums.....lb	.40	.41	.41	.40
				Dithiofuroate, 100 lb dr....lb.	.....	1.00	1.00	1.00
.09	.09	.09	.09	Dust, 500 lb bbls c-1 wks..lb.	.08½	08½	.08½	.08½
6.40	6.07½	7.35	6.40	Metal, high grade slabs c-1 NY.....100 lb.	.....	6 45	6.45	6.45¾
.07¼	.07¼	.07¼	.07¼	Oxide, American bags wks..lb.	.07¼	.07¼	.07¼	.07
.12¾	.10¾	.10¾	.10¾	French, 300 lb bbls wks...lb.	.09¾	.11¾	.11¾	.09¾
.....	.....	.....	.....	Perborate, 100 lb drs.....lb.	.....	1.25	1.25	1.25
.....	.....	.....	.....	Peroxide, 100 lb drs.....lb.	.....	1.25	1.25	1.25
.....	.....	.....	.....	Stearate, 50 lb bbls.....lb.	.25	.26	.26	.25
.03¾	.03½	.03½	.03	Sulfate, 400 bbl wks.....lb.	.03½	.03¾	.03¾	.03½
.32	.30	.30	.30	Sulfide, 500 lb bbls.....lb.	.30	.32	.32	.30
.30	.29	.29	.29	Sulfocarbolate, 100 lb keg..lb.	.29	.30	.30	.29
.32	.32	.38	.32	Xylene, 10 deg tanks wks...gal.	.....	.33	.33	.33
.32	.30	.36	.30	Commercial, tanks wks...gal.	.30	.32	.32	.30
.38	.38	.35	.35	Xylidine, crude.....lb.	.....	.38	.38	.38
.03	.02½	.02½	.02½	Zirconium Oxide, Nat. kegs...lb.	.02½	.03	.03	.02½
.50	.45	.45	.45	Pure kegs.....lb.	.45	.50	.50	.45
.10	.08	.08½	.08	Semi-refined kegs.....lb.	.08	.10	.10	.08

Oils and Fats

.14½	.13	.14	.13	Castor, No. 1, 400 lb bbls.....lb.	.13	.13½	.13½	.13
.14	.12½	.14	.12½	No. 3, 400 lb bbls.....lb.	.12½	.13	.13	.12½
.17	.14	.18	.17	Blown, 400 lb bbls.....lb.	.14	.15	.15	.14
.17	.14½	.31	.13½	China Wood, bbls spot NY...lb.	.14½	.15	.15½	.14½
.14¾	.14¾	.18	.12½	Tanks, spot NY.....lb.	....	.14½	Nom.	.....
.14¾	.12½	.....	.....	Coast, tanks, May.....lb.	.....	13¾	.14½	.12½
.11½	.10½	.12	.12	Cocoanut, edible, bbls NY....lb.	.....	.10½	.10½	.10¾
.10	.09½	.09½	.09	Ceylon, 375 lb bbls NY....lb.	.08	.08½	.09½	.08
.09	.08½	.08½	.08	8000 gal tanks NY.....lb.	.07½	.07¾	.08¾	.07½
.10½	.09½	.10½	.09½	Cochin, 375 lb bbls NY....lb.	.....	.09¾	.10	.09¾
.09¾	.08¾	.10	.08¾	Tanks NY.....lb.	.08¾	.09	.09½	.08¾
.10	.08¾	.09¾	.08¾	Manila, bbls NY.....lb.	.08	.08½	.09½	.08
.08¾	.08	.08¾	.08½	Tanks NY.....lb.	.07½	.07¾	.08¾	.07½
.08½	.07¾	.08¾	.08	Tanks, Pacific Coast.....lb.	.06¾	.06¾	.08	.06¾

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1829 $1.047 - May 1929 $1.04

All prices by that time were but two points higher than when last quoted, with tanks at 9.5c lb., barrels at 10.3c lb., and five-barrel lots at 10.7c lb. Stocks of linseed oil on hand March 31, 1929, were 24,191,812 gallons, or lower than the stocks at this date for the past three years. Last year, there were nearly 32,000,000 gallons on hand at this date. The production during the first three months of the year was 26,683,036 gallons, compared to nearly 30,000,000 for the same period last year. This gives a consumption for the first quarter of this year of 23,553,900 gallons, compared to the record consumption for this same three months period of last year of 23,981,275 gallons. This makes our consumption for the first six months of this present crop year 46,194,730 gallons, compared to consumption for the same period of our last crop year of 45,557,239 gallons. In other words, the consumption of linseed oil in this country from September 1, 1928, to March 31, 1929, has established a new record.

Palm Oil — Demand has fallen off somewhat and as a result quotations are ½c lb. lower on Lagos and ¼c lb. lower on Niger, the former being at 8¼c lb. and the latter at 8c lb. Palm oil exports from North Sumatra during 1928 totaled 26,003 tons, valued at $3,356,281, an increase of 5,510 tons and $595,816 over 1927, according to the Department of Commerce. Of the total approximately 52 per cent., or 13,666 tons were shipped to the United States. The remainder went mainly to Holland, Great Britain, Germany and France. Exports of palm kernels during the year totaled 5,439 tons, of which 4,425 were shipped to Holland, 662 to Germany, 275 to Great Britain and the remainder to Belgium. According to conservative estimates there are about 60,000 hectares now planted in oil palms in North Sumatra with a potential productivity of 120,000 tons, per annum.

Soy Bean Oil — Conditions have remained unchanged during the past month with domestic material supplying all demands, thus forcing imported material out of the market. This condition seems quite likely to continue as the last report of the domestic mills indicated that they had sufficient supplies of raw material to continue in constant production until the arrival of new crop.

Whale Oil — Norwegian whale oil production during the season just closed totaled 1,210,000 barrels, against 750,000 barrels last season. The value of this year's production was placed at 105,000,000 kroner, ($28,003,500) against 62,000,000 kroner ($16,535,400) last year.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Cod, Newfoundland, 50 gal bbls			
.69	.63	.66	.63	.....gal.	.63	.64	.63
.63	.60	.59	.59	Tanks NY.....lb.	.....	.60	.60	.60
				Cod Liver see Chemicals.....			
.06½	.05½	.06	.06	Copra, bags.....lb.	.....	.046	.05½	.046
.11	.10	.11	.07	Corn, crude, bbls NY.....lb.	.....	.09½	.10½	.09½
.10	.08½	.09½	.07	Tanks, mills.....lb.	.....	.08	.09½	.08
.12½	.11½	.14	.10½	Refined, 375 lb bbls NY...lb.	.....	.10½	.11½	.10½
.11½	.10½	.12	.11	Tanks.....lb.	.....	.09½	.11	.09½
.09½	.07½	.09½	.06½	Cottonseed, crude, mill.....lb.	.....	Nom.	.09	.08½
10.65	.09½	.11½	.08 1/5	PSY 100 lb bbls spot.....lb.	.....	.096	.1075	.096
10.75	.09½	.....	.....	June—Aug.....lb.	.....	.098	.1080	.098
				Degras, American, 50 gal bbls			
.05	.04½	.04½	.04½	NY.....lb.	.04½	.05	.05	.04½
.05½	.04½	.04½	do	English, brown, bbls NY....lb.	.....	.05½	.05½	.05½
.05½	.05½	.05½	.05½	Light, bbls NY.....lb.	.....	.05½	.05½	.05½
				Greases			
.08½	.07	.07½	.06	Greases, Brown.....lb.	.....	.07	.08½	.07
.08½	.07	.08	.06½	Yellow.....lb.	.....	.07½	.08½	.07½
.11	.09½	.10½	.08½	White, choice bbls NY.....lb.	.....	.07½	.11½	.07½
.42½	.40	.....	.....	Herring, Coast, Tanks.....gal.	.....	Nom.		
Nom.	.09½	.09½	.09	Horse, bbls.....lb.	.09½	Nom.	Nom.	.....
.16½	.15½	.16½	.14½	Lard Oil, edible, prime.....lb.	.....	15½	.15½	.15½
.13½	.12	.13½	.10½	Extra, bbls.....lb.	.....	.13½	.13½	.13½
.13	.11	.12½	.10½	Extra No. 1, bbls.....lb.	.....	.12½	.13½	.12½
10.8	10.0	.11 4/5	.10 2/5	Linseed, Raw, five bbl lots...lb.	.....	.107	.107	.105
10.4	9.6	.11 9/10	.09 6/10	Bbls c-l spot.....lb.	.....	.103	.103	.101
9.6	8.8	.10½	.09	Tanks.....lb.	.....	.095	.095	.093
.09½	.09½	.09½	.09½	Lumbang, Coast.....lb.	.....	.09½	.09½	.09½
.48	.40	.47½	.44	Menhaden Tanks, Baltimore.gal.	.....	.52	.52	.52
.09	.09	.90	.10	Blown, bbls NY.....lb.	.....	.09	.09	.09
.70	.67	.70	.67	Extra, bleached, bbls NY..gal.	.....	.70	.70	.70
.64	.63	.66	.63	Ligh, pressed, bbls NY....gal.	.63	.64	.64	.63
.67	.66	.66	.69	Yellow, pressed, bbls NY..gal.	.66	67	.67	.66
				Mineral Oil, white, 50 gal bbls			
.60	.40	.....	.....	.....gal.	.40	.60	.60	.40
1.00	.95	.....	.....	Russian, gal.....gal.	.95	1.00	1.00	.95
.19	.18½	.18½	.14½	Neatsfoot, CT, 20° bbls NY..lb.	.....	.18½	.19	.18½
.13½	.12	.13½	.10½	Extra, bbls NY.....lb.	.....	.12½	.13½	.12½
.16½	.15½	.16½	.12½	Pure, bbls NY.....lb.	.....	.14½	.15½	.14½
.17½	.11½	.18½	.10	Oleo, No. 1, bbls NY.....lb.	.....	.10½	.11½	.10½
.15½	.11	.17	.08½	No. 2, bbls NY.....lb.	.....	.10½	.11½	.10½
.14	.10	.14	.08½	No. 3, bbls NY.....lb.	.....	.10	.10½	.10
1.40	1.18	1.75	1.40	Olive, denatured, bbls NY...gal.	1.25	1.30	1.30	1.25
2.00	1.75	2.00	2.45	Edible, bbls NY.....gal.	1.95	2.00	2.00	1.95
.11	.09½	.10½	.08½	Foots, bbls NY.....lb.	.10	.10½	.11½	.10
.09½	.08½	.09½	.09	Palm, Kernel, Casks.....lb.	.....	.09	.09	.08
.09½	.07½	.08½	.07½	Lagos, 1500 lb casks.....lb.	.....	.08½	.09	.08½
.08½	.07	.08½	.07½	Niger, Casks.....lb.	.....	.08	.08½	.08
.12½	.12	.14½	.12	Peanut, crude, bbls NY.....lb.	.....	Nom.	Nom.	.....
.17	.14½	.15½	.14½	Refined, bbls NY.....lb.	.14½	.15	.15	.14½
.21	.13	.16½	.12½	Perilla, bbls NY.....lb.	.....	.16	.20	.16
.15½	.10½	.14½	.10	Tanks, Coast.....lb.	.....	.13½	.14½	.13½
1.75	1.70	1.70	1.70	Poppyseed, bbls NY.....gal.	1.70	1.75	1.75	1.70
1.06	1.01	1.05	1.00	Rapeseed, blown, bbls NY...gal.	1.04	1.04	1.04	1.04
.92	.83	.90	.82	English, drms. NY.....gal.	.88	.90	.90	.85
.90	.81	.85	.76	Japanese, drms. NY.....gal.	.84	.86	.88	.84
.10½	.09½	.10	.09	Red, Distilled, bbls.....lb.	.10½	.11½	.11½	.10½
.09½	.08	.09½	.08½	Tanks.....lb.	.....	.09½	.10½	.09½
.5.	.42	.50	.50	Salmon, Coast, 8000 gal tks..gal.	.42	.44	.44	.42
.50	.41	.47	.43	Sardine, Pacific Coast tks...gal.	.....	.45	.51	.45
.13½	.12	.13	.11½	Sesame, edible, yellow, dos...lb.	.11½	.12	.12	.11½
.15	.12½	.14	.14	White, dos.....lb.	.12½	.12½	.12½	.12½
.40	.40½	.40	.40	Sod, bbls NY.....gal..	.....	.40	.40	.40
.....	.....	.09½	.09½	Soy Bean, crude.....				
.09½	.09	.....	.....	Pacific Coast, tanks.....lb.	.....	.09	.10	.09
				Domestic tanks, f.o.b. mills, ...lb.	.....	.08½	.08½	.08½
.12½	.12	.12½	.10½	Crude, bbls NY.....lb.	.....	.11½	.12½	.11½
.10½	.10½	.11	.10½	Tanks NY.....lb.	.....	Nom.	.10½	.10½
.13½	.13½	.13	.12	Refined, bbls NY.....lb.	.13½	.13½	.13½	.13½
				Sperm, 38° CT, bleached, bbls				
.85	.84	.85	.84	NY.....gal.	.84	.85	.85	.84
.80	.79	.82	.79	45° CT, bleached, bbls NY gal.	.79	.80	.80	.79
.18½	.11	.13½	.11½	Stearic Acid, double pressed dist bags.....lb.	.15½	.16	.18½	.15½
				Double pressed saponified bags .....lb.	.16	.16½	.19	.16
.20½	.13½	.15½	.13½	Triple, pressed dist bags..lb	.18	.18½	20½	.18
.12½	.09½	.13	.08½	Stearine, Oleo, bbls.....lb.	.....	.10	.12	.10
.09½	.08½	.09	.07½	Tallow City, extra loose.....lb.	.07½	.07½	.08½	.07½
.10½	.09½	.11	.08½	Edible, tierces.....lb.	.....	.09	.10½	.09
.12½	.11½	.10½	.08½	Tallow Oil, Bbls, c-1 NY...lb.	.....	.11½	.12	.11½
.11½	.10½	.12½	.10	Acidless, tanks NY.....lb.	.....	.10½	.11	.10½
Nom.	.08	.08½	.07½	Vegetable, Coast mats.....lb.	.08	Nom.	Nom.	.08
.11	.....	.11	.11	Turkey Red, single bbls.....lb.	.11	.12	.12	.11
.16	.14	.14	.14	Double, bbls.....lb.	.14	.16	.16	.14
				Whale, bleached winter, bbls				
.80	.78	.78	.78	NY.....gal.	.78	.80	.80	.78
.82	.80	.80	.80	Extra, bleached, bbls NY..gal.	.80	.82	.82	.80
78	.76	.76	.76	Nat. winter, bbls NY.....gal.	.76	.78	.78	.76

Local Reports *from our Correspondents at the Principal Consuming Centers of Industrial Chemicals*

California

Illinois

LOS ANGELES

Calcium chloride is showing seasonal activity. Local prices on tri-sodium phosfate have been somewhat reduced. Acetic acid is still being held at a low level.

DETROIT

Chemical and general business conditions in the Detroit territory continue very good, although we believe there has been a slight let-up among automobile manufacturers. Collections are also exceptionally good.

KANSAS CITY

Business is moving along in a normal fashion and not quite as active as in the first few months of the year. There is a growing feeling of uneasiness due to Stock Market conditions, and collections are somewhat slower. Unusual frenzy was apparent in the booking of alcohol contracts for fall deliveries this year and despite endeavors to maintain a stabilized marketing program, rumors were current as to concessions, but the majority of business was entered in an ordinary manner. A new development is the proposal to treat coal at mines with calcium chloride opening up a new outlet for this material. Sodium chlorate for weed killing has increased in demand and broadened the market for this commodity. The situation for the agricultural industry with a large wheat crop predicted and with falling prices, is expected to decrease buying power some what in the Middle Western States.

ST. LOUIS

The general good business of March and April in this territory, has continued through the month of May. The agricultural trade and the paint industry both show a heavy demand for chemical materials. Naval stores have remained firm in price and deliveries against contract have been good. Chemicals for water treatment have moved in large quantity throughout the Mississippi Valley because of high water. The stove industry got off to a late start, but during the month of May, demand for enameling chemicals was heavy. For the most part orders coming from the wholesale drug houses have been routine. In spite of the proposed increase in duty on stearic acid and tallow, the market for stearic and oleic acids has been weak and each of these items fell off ¼c per lb. Pressure in the metal markets having been relieved, the position of metallic salt was not as strong as it was a month ago, tin oxide having fallen off 2c per lb. and the salts a certain of the other metals are showing signs of weakness.

Massachusetts

Michigan

Missouri

Local Reports

from our Correspondents at the Principal Consuming Centers of Industrial Chemicals

Missouri---(cont.)

New Jersey

New York

NEWARK

The call for industrial chemicals and kindred lines in the Newark district is such that we can safely class business conditions as excellent. While it is, of course, true that there are certain soft spots, industry as a whole is in fine condition. Standard lines of commodities are firm in price and there does not seem to be a surplus of raw material or finished product being offered which keeps the market in a stable condition. Manufacturers while not inclined to predict very far ahead are apparently hopeful that these conditions will continue; at least that seems to be the prospect for the immediate future. Mineral acids, alkalies, and their derivatives are running heavily.

CLEVELAND

The main feature of the past month was the large booking of denatured alcohol for fall delivery to the anti-freeze buyers. The large jobbers and oil companies covered their requirements fully. Linseed oil jumped from 9.2c to 9.6c on account of the increased duty on flaxseed. This was done without any advance notice and brought about considerable purchasing by buyers who were not protected throughout the summer. The taking out of commitments of linseed has improved greatly over the early part of the year. The paint, varnish and lacquer manufacturers are going along full speed with no signs of any let-up. This is in spite of the wet weather we have had during the past month and now that warm weather has arrived there is every indication that business will go on at even a greater rate. General business in the Cleveland territory is good.

PHILADELPHIA

Conditions have been rather "humdrum" in the chemical line lately. Contract demand for caustic soda, soda ash etc. has slacked up to some extent and acids and other heavy chemicals have not been in urgent call. These conditions are no doubt brought about by seasonal slackening in the textile trade and most interests are looking forward to a revival of business in the near future. The situation in imported products such as epsom salts, sodium phosphate etc. have been more or less upset by the tariff situation and an urgent effort to get shipments in before the tariff is effective. This situation has brought about a condition of a few early shipments being sacrificed and prices have been slightly upset. Seasonal items like naphthalene, calcium chloride, bluestone etc. are still in fairly active demand although the buying is more or less of hand-to-mouth proportions. Collections are fair.

Ohio

Pennsylvania

Rhode Island

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Old established manufacturers of industrial chemicals in the Philadelphia District desire to expand activities through the acquisition of commercial processes and through the representation of domestic manufacturers who desire to market in Philadelphia and surrounding territory. Warehouse facilities with two rail connections. Box 834 CHEMICAL MARKETS.

PARTNER WANTED—Chemist who has invented number commercial chemical processes desires party who can finance while inventing new chemical processes. Box 835 CHEMICAL MARKETS.

BUY YOUR PRODUCTS INSTEAD OF ENLARGING YOUR PLANT—When business is brisk and your factory cannot make up all your orders, use us as confidential intermediaries. When business slows down you will have profits instead of idle machinery. H. J. Jackson, 25 Beaver Street, New York.

CHEMICAL INVESTMENT OPPORTUNITY

CHEMIST WANTED—with experience in organic or colloid chemistry is offered opportunity to buy an active interest in an established growing chemical business. Location New York City. Investment $5,000—10,000 required which will be secured by mortgage on New York City real-estate. Write giving full details. Box 837.

Situation Wanted

CHEMICAL EXECUTIVE, PH.D., organic, capable of businesslike direction of chemical department toward best practical results and full co-ordination of chemical research, development and/or production work with progressive policy of general management and the constant needs of sales, purchasing and other departments. Highest references. Box, 823.

For Sale or Rent

FOR SALE—Voland & Son Balance Scales. Scales are new—priced right. H. S. Newcomer & Son, Mt. Joy, Pa.

Warehouse Space For Rent

Downtown New York Drug & Chemical firm will rent 1-2 floors in their warehouse with service—electric elevator. Out of town manufacturers desirous of carrying stocks in lower New York should be interested. Box 801, Chemical Markets

Surplus Stocks

We purchase any quantity of surplus and discontinued stocks of—Chemicals, Oils, Waxes, Gums, Drugs, Coal Tar Products, Intermediates, Colors and Allied Products. Also By-Products and Residues. Box 775 Chemical Markets.

Raw Materials

THE BY-PRODUCT or waste you are dumping or burning may have potential value. We may be able to develop it if you will send a representative sample to The International Products Corporation, Trenton, New Jersey.

Equipment

WANTED—CHEMICAL MARKETS, Vol. 19, No. 4, 8, 10, 12, 16, 18, 20, 22, 24, 26, 28, 30, 32, 1926 issues. Library of Congress, Washington, D. C.

BACK VOLUMES of CHEMICAL MARKETS suitable for binding. Tell us what volumes you need to complete your library, and we will quote you. Address CHEMICAL MARKETS, 25 Spruce Street, New York, N. Y

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SALESMAN—To sell Stearic Acid and Red Oil; one with experience in this line preferred. Write full particulars of training and experience. Applications and inquiries confidential. Box 830, CHEMICAL MARKETS

WANTED: Young man under thirty, fully versed in the technique of Coal Tar Products, who has had at least five years experience with principal Coal Tar people. Box 828 CHEMICAL MARKETS.

SALESMEN calling on consuming trade all parts of the country. Money-making proposition for live wires and 100% honest men. Will not interfere with present work. Box 833 CHEMICAL MARKETS.

CHEMICAL SALESMAN: A chemical importing house wants an experienced man with some technical knowledge and acquaintance in the trade. Substantial salary and future for a man who is willing to make the necessary effort and has the right ability. Box 836 CHEMICAL MARKETS.

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Index To Advertisers

"WE"—Editorially Speaking

Although we know it just isn't being done, we cannot help but "point with pride" to Mr. Tyler's article on nitrogen which appears elsewhere in these pages. Of course, like many of our contributors, Mr. Tyler is an author in his own name, but even so, we feel that he is to be complimented upon the good job he has done with this subject, about which there has been so much written during recent years.

Mr. Tyler, by the way, was one of the visitors at our booth at the alleged Chemical Exposition. We took advantage of his visit to apologize for the fact that we had been holding his article in type for so long without printing it, explaining that our editorial schedule was so arranged that we had been forced to delay publication of his article. He assured us that it was perfectly all right with him, but added a warning that we had better not hold it too long as figures on nitrogen change rapidly these days. So if any of the statistics quoted in the article are not right up to the split-second, you may blame us and not Mr. Tyler.

Our booth at the exposition was very favorably located. It was directly opposite a huge sifter of some description which went into operation at the most unexpected times, meanwhile emitting a noise like a riveting machine or a machine gun. This was very disconcerting, especially to our visitors, who could be counted upon to jump and perhaps knock the flowers off the table.

Our visitors at the exposition were, of course, "too numerous to mention," but among those who ventured in to sit down or leave a package or an overcoat, were Mr. Rand of Merrimac, Dr. Brown of Bucknell, Dr. MacGregor of Colgate, Mr. Hotchkiss of Hooker, Dr. Haertel, Dr. Whittaker, Dr. Grosvenor, Mr. Haines of U. S. I., Mr. Boschen of Grasselli, and Mr. Murphy of Mutual. This does not include furniture salesmen or florists, or those who waved as they walked by, or those who dropped things on us from the mezzanine.

After a week at the exposition we began to feel like Televox, the mechanical man who opened the show each day. The chief impression was one of noise and constant procession of visitors by the booth. Equipment salesmen talking animatedly to a prospect or relaxing dog-tired in a chair—chemical executives and consultants greeting old friends or inspecting some new development in chemical machinery—out-of-town plant men rushing through the exhibits in order to keep up with what was new—foreign faces, moving in groups, sometimes with an American friend or business associate, scrutinizing everything closely and asking observant questions—older students doing much the same thing, and younger students racing by with huge bags or briefcases into which went everything that wasn't nailed down—the casual passer-by who wandered in alone or with his girl, because someone gave him free tickets—such was the Chemical Exposition. And hovering above and influencing them all was the impression of machinery and mechanics and movement.

COMING FEATURES

DAIRY PRODUCTS AS CHEMICAL RAW MATERIALS

Dr. L. A. Rogers, in charge of the Dairy Research Laboratories, Bureau of Dairy Industry, United States Department of Agriculture, discusses the part played by the cow in the scheme of chemical economics.

CHEMISTRY AND RADIO

The first of a series of articles on the contributions of chemistry to the development of our more modern industries. Austin C. Lescarboura, author of many magazine articles on the subject of radio, introduces this series with the story of the chemistry of radio.

INDUSTRIAL USES OF WATER IN THE CHEMICAL INDUSTRY

Charles P. Hoover, Chemist in Charge of the Water Softening and Purification Works, of the City of Columbus, Ohio, points out the economic factors involved in the use of water in chemical manufacturing processes.

Both those who do, and those who do not, make or use aniline oil will find the article by Dr. Groggins well worth a careful reading. It might well serve as a model for an economic study of the factors entering into process and production costs, regardless of the chemical.

We have long known of the considerable interest which centers about the plant and operations of the Keystone Wood Chemical & Lumber Corp., at Glenfield, N. Y., and we have finally succeeded in persuading Mr. Quinn to furnish us with the story and pictures on "Modern Wood Distillation" as carried on by that company in what is the largest wood distilling operation in the world.

Now that summer has put in a tentative appearance, Mr. Panter's article on calcium chloride becomes a very seasonable one. Most of us are already familiar with what it can do to dust on tennis court, race-track, and rustic or suburban roads, but some of us may not know of the new use which has developed for this chemical in treating coal.

Our plant management section this month contains two unusually practical articles—one on the ever absorbing story of power costs, by Mr. Buck, chief engineer of the H. K. Ferguson Co., and one on portable loaders by Mr. Kidder, of the Link-Belt Co.

In New York, the Chemists' Club is more so than ever the place to come and relax during luncheon. With new buildings going up both in front and in back, the tired chemical business man is offered a rare treat with his luncheon. The duo of riveters operating front and back furnish quite a relief from the solo riveter who accompanies his working hours in the office, next to which only one building is being constructed.

One day recently, Bob Quinn of Mathieson was telling one of his stories (as only he can tell them) when, without warning, both front and back riveters stopped at the same time. The result was that practically everyone south of Columbus Circle heard the climax of the story, much to Mr. Quinn's rather evident embarassment.